THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

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Make Glass Sand With Special Processing Units page 46
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Spread Limestone by Plane In New Zealand page 90

Godwin phosphate plant, formerly operated by T.V.A. at Columbia, Tenn., recently purchased by International Minerals & Chemical Corp. It will be modernized at a cost of $750,000

These Crushers
Give Double Service!
Williams Heavy Duty
Reversible Hammer Mill for top
output of crushed stone, clay, shale
and all other heavy abrasive materials.

WILLIAMS *Reversible* HAMMER MILLS

Double service from hammers, breaker plates and grate bars—maintenance reduced to half or less—downtime cut as much as 50%—these are only a few of the money-making, time-saving features of Williams Reversible Hammer Mills.

Operation either clockwise or counter-clockwise with a reversible motor promises that hammers and other internal parts will work twice as long without even opening the machine. Slower and more even wear results in continuous peak output of a uniformly high quality product while, at the same time, demanding the very minimum of time and expense in the replacement of worn parts.

Reversible manganese breaker plates also give twice the usual length of service, and are adjustable to compensate for hammer wear to maintain original close settings.

For the most in real operating economy, high production and top quality products, get the facts about Williams Reversible Hammer Mills. *Write For Catalog.*

Open view of Reversible Hammer Mill. Note heavy shock-proof, wear-resistant manganese steel liners and breaker plates, and the rugged, reinforced construction. Entire interior easily, quickly accessible. Rotor removable without disturbing feeder or feed chute.

WILLIAMS PATENT CRUSHER & PULVERIZER CO.
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WILLIAMS

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Impactors Holix-Seal Mills Roller Mills Air Separators Vibrating Screens Feeders

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The design and manufacturing refinements that go into the Ley bushed line are typical of the care that Link-Belt gives to every detail of every chain. And, because Link-Belt builds a complete line, you're sure to get the one best-suited to your exact requirements. Ask your Link-Belt representative or distributor for all the facts on Link-Belt chains and sprockets today.

No ONE chain serves every purpose—get the RIGHT one from LINK-BELT's complete line

LXS chains are made to close tolerances from carefully selected steels. Ideal for rugged drive and conveyor service.

Class C combination chain—popular, durable, low-cost design for elevators and conveyors.

Class SS bushed roller chain with straight sidebars—for practically any conveyor or elevator.

Link-Belt "Flint-Rim" cast sprockets give extra long life. Cast steel sprockets for most severe service.

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ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY — LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

September 1955

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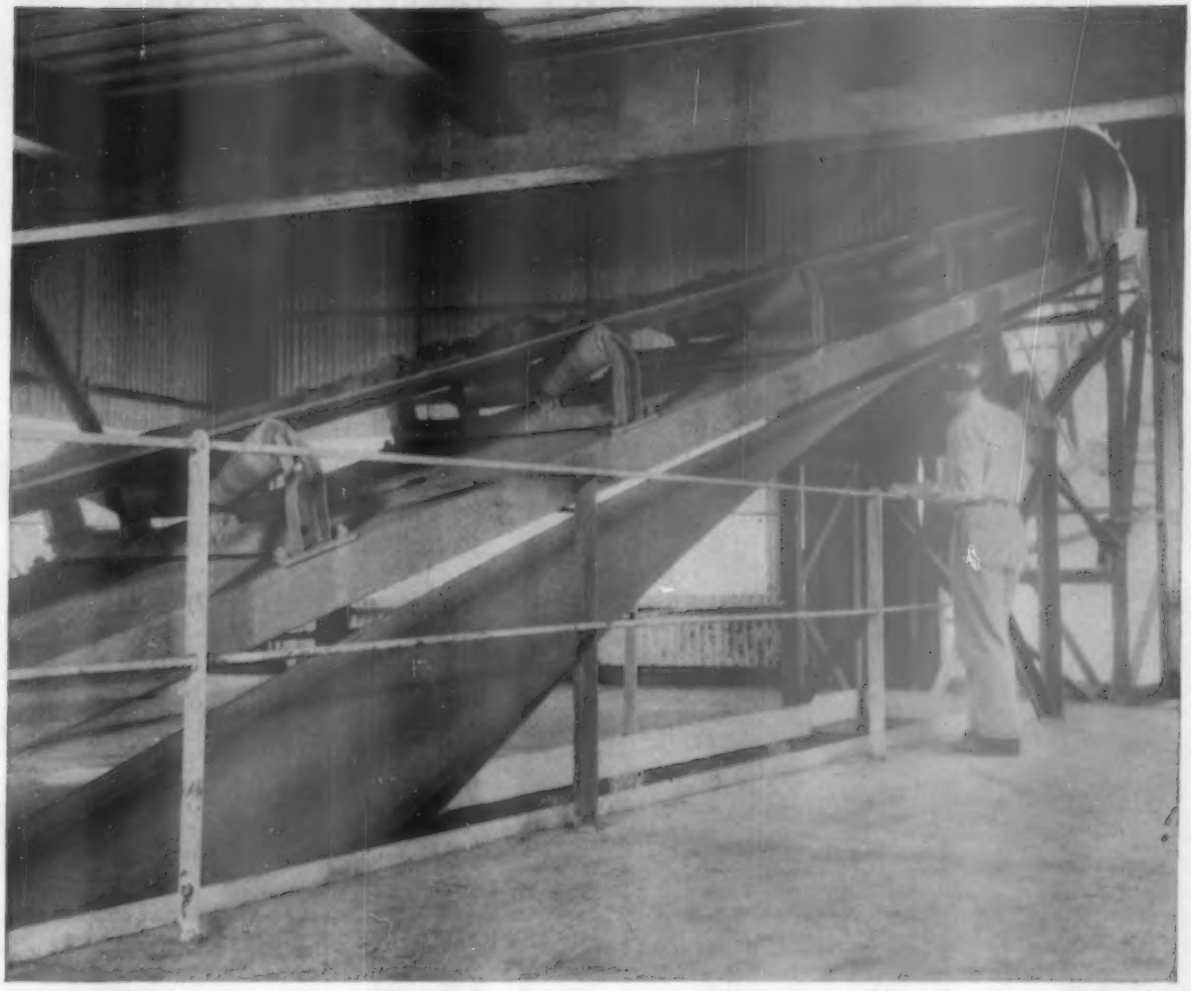
RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



How conveyors stay clean even when load is sticky

THAT stuff riding the conveyor belt is refuse from a coal washing plant on its way to a dumping point—550 feet uphill. When plans were drawn up, engineers said the usual conveyor system wouldn't be the answer here. They knew the wet clay and sticky sand would cling to the belt, build up into gummy layers, clog the return idlers and pulleys, and damage the belt cover.

To avoid this trouble, they installed something quite different in conveyors—the B. F. Goodrich "Turnover" belt system. Here's how it works. As the material is dumped off the end of the moving belt, the belt makes a 180° turn, runs empty along the return idlers, then makes another one-half turn (as shown above) before receiving the next load.

Only the clean side of the belt touches the idlers, so there's no chance for sticky materials to build up on them. Even wet materials can be handled in cold weather without danger of the belt freezing to the rotating metal parts.

With the "Turnover" belt, expensive decking can be eliminated. Clean up of spillage is no problem because any material that falls on the lower run of the belt is carried to the end and dumped off when the belt makes its turn. Damage to belt body is reduced because lumps of materials cannot be trapped between the belt and pulleys.

If you have an operation where sticky, freezing or corrosive materials must be moved from place to place, the B. F. Goodrich "Turnover" conveyor system can save you trouble and money. Your B. F. Goodrich distributor can give you full details and show you how easy it is to convert any conventional system into the turnover type. *The B. F. Goodrich Company, Dept. M-464, Akron 18, Ohio.*

B.F.Goodrich
INDUSTRIAL PRODUCTS DIVISION

In New Jersey... And the World Over

BUCYRUS-ERIE WARD LEONARD ELECTRIC SHOVELS

Help Put The Lid On Rising Costs

A Bucyrus-Erie 110-B shovel loads blasted rock in a New Jersey quarry.

In every design and construction feature Bucyrus-Erie Ward Leonard electric shovels are built to save you money. They have the capacity and performance ability to deliver high output at an economical cost per yard.

Modern front-end design eliminates dead weight, lets power work effectively swinging payloads. Boom strength is greatest where it's needed most to withstand digging and swinging stresses. Ward Leonard control results in fast acceleration and deceleration, provides extra torque and ample usable power. Heavy-duty construction keeps maintenance costs down and adds years to machine life.

All over the world — in mines, in quarries, and on big construction projects — Bucyrus-Erie Ward Leonard electric shovels are being used to handle the toughest digging and loading assignments. Those who use them know that Bucyrus-Eries, with their fast operating cycles and durable construction, provide the dependable high-output and low-cost performance that means profitable operation.

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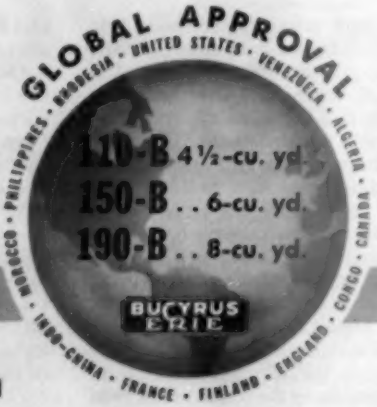
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TOP CAPACITY PRODUCTION

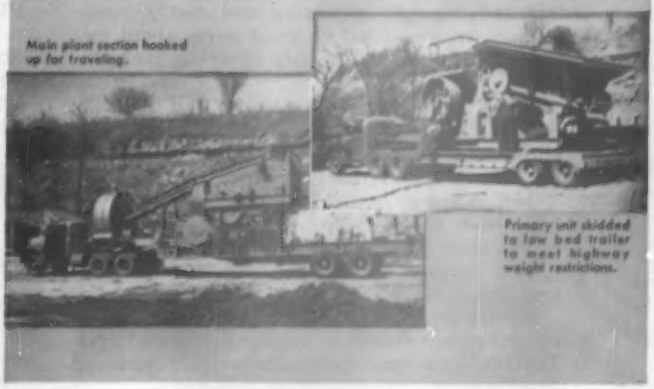
The TwinDual Pacemaker gives you three full stages of reduction for top capacity—a Universal overhead eccentric jaw crusher in the first stage and a TwinDual roll crusher for the second and third stages.

No other single unit plant offers so many big-profit advantages. Big primary jaw crusher accepts large rock—lets you work gravel pits containing big boulders. Exclusive TwinDual two-stage roll crusher gives top capacity secondary crushing. Its high ratio of reduction permits the primary jaw to operate at 50 to 100% wider discharge opening. This results in greater capacity—less jaw wear. Larger inclined gyrating screens with full screening area allow 20 to 25% greater output. All operations from apron feeder to delivery conveyor are driven through one single power unit.

For top capacity with three stages of reduction—and a bonus in longer crusher life, lower horsepower requirements and a better quality finished product, choose a Pacemaker. Available in five models for pit or quarry operation. Get complete profit making facts now.

LOW TRAVELING WEIGHT

The primary jaw crusher, apron feeder with grizzly by-pass, operator's platform and structural supports are all mounted as a single unit on skids. This primary unit is bolted to the main truck frame. When highway weight limitations must be met, this unit may be quickly skidded to a low bed trailer and transported separately.



Main plant section hooked up for traveling.

Primary unit skidded to low bed trailer to meet highway weight restrictions.

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In Cedar Rapids Since 1906

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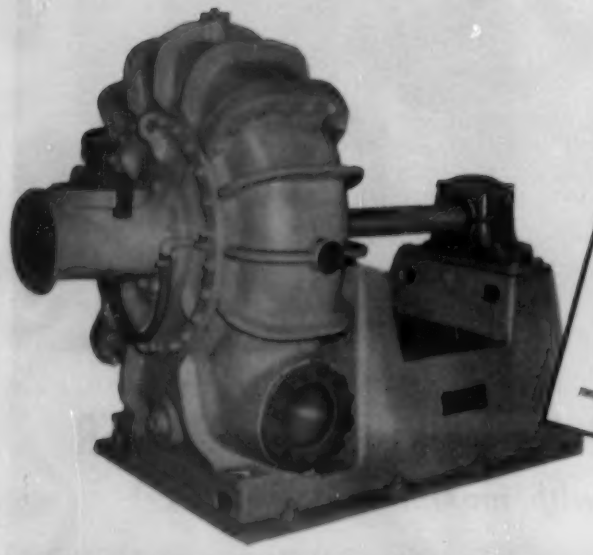
Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

Another Customer Speaks



RUSSELL W. WARD, Inc.
Sand • Ceramic Clay • Gravel
P. O. BOX 161
PALMYRA, N. J.

Thomas Foundries, Inc.,

May 17, 1955

In May of 1953, we installed a Series 11 THOMAS DURABLE DREDGE PUMP on our dredge. Our first pump, of another manufacture, required extensive repairs to all wearing parts about every two or three weeks. Since recovery of sand and gravel by dredge was a new method for us, we considered it, perhaps, we hadn't made a costly mistake in changing over to such an operation. In desperation, we decided to investigate the claims made for your pump, and can honestly say that its installation has been the salvation of our investment.

We are now getting approximately a years service from the pump parts, but, needless to say, the elimination of the costly down time has been a life saver, enabling us to keep up with the demand for our products by having stock piles large enough to meet any emergency.

As you can see, we are most pleased with the results of the THOMAS DURABLE DREDGE PUMP, and are happy to recommend it to anyone needing a pump which will do a real, tough job.

Very truly yours,

RUSSELL W. WARD, INC.

RUSSELL W. WARD,
President.

OUR THOMAS PUMP—*a real "life saver"*

WE WILL RECOMMEND IT TO ANYONE!

No small wonder Mr. Ward is pleased with the results of his THOMAS DURABLE DREDGE PUMP—it meant the difference between success and failure of his new dredging operation for recovery of sand and gravel.

Mr. Ward's first pump (of another manufacture) required extensive and costly maintenance repair to all wearing parts about every 2 or 3 weeks—seriously effecting his operation.

NOW he gets approximately ONE YEARS SERVICE from Thomas Pump parts and he so eliminated costly down-time that his investment is now completely secure.

Mr. Ward is happy . . . and so are we to have been able to help him. We can help you in the same way, if you are pumping sand and gravel with a pump of conventional design and materials.

Wearing parts of Thomas Pumps are made of modern, abrasion resisting alloyed NI-HARD. Its advantages in longer life, increased production, reduced repair costs and down-time are so impressive that they are actually hard to believe.

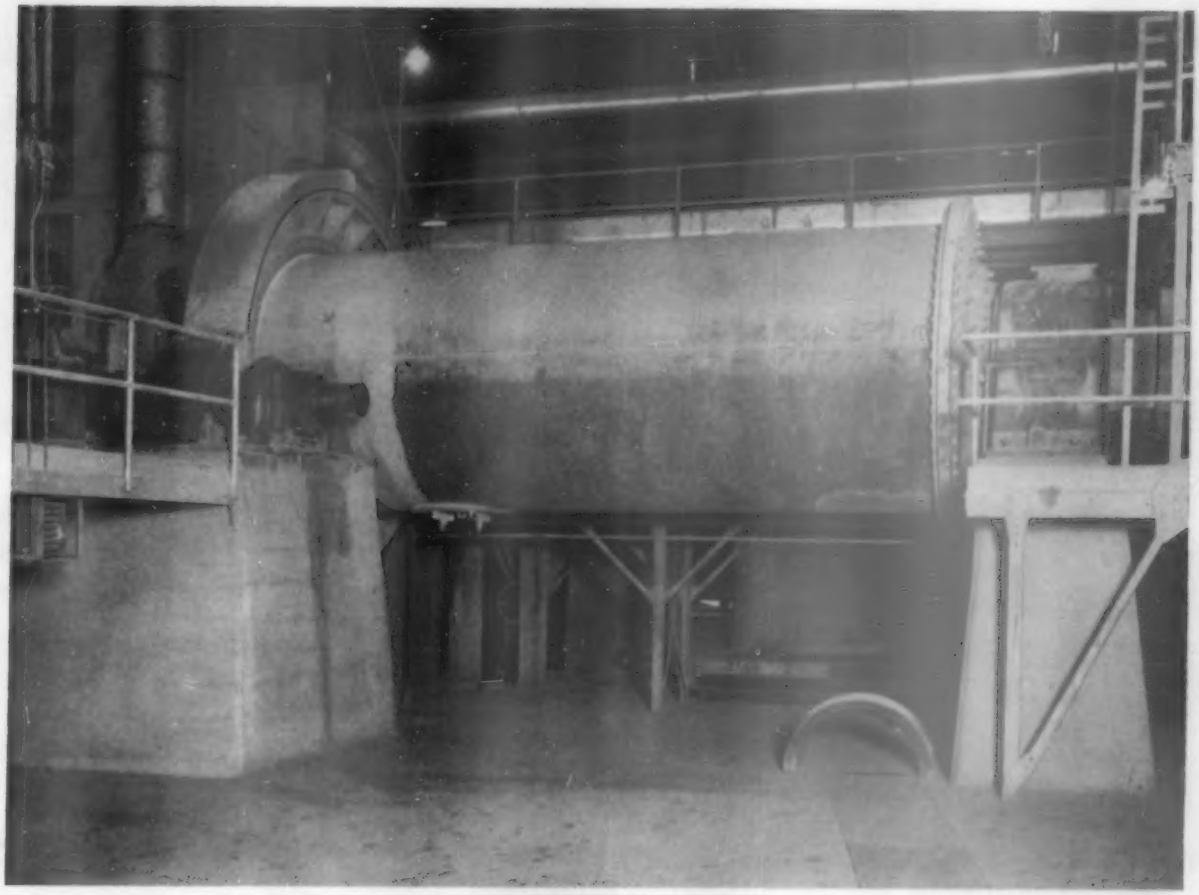
Read what Mr. Ward says in his letter. He is one of the many users who have had the same profitable experience with a THOMAS PUMP.

If you are interested in a pump which will do a real tough job of work—investigate today what the THOMAS DURABLE DREDGE PUMP will do for you.

You can't buy a more durable pump than a "Thomas" for sand and gravel—you can't buy one that will make you as much money.

THOMAS FOUNDRIES, *Incorporated*

P.O. BOX 1111 . . . . BIRMINGHAM, ALABAMA



Complete Several Grinding Operations Using a Single Power Source and Drive

A Traylor Compartment Mill is partitioned into 2 or more sections. Slotted diaphragms separate these sections or compartments. As the material in each compartment is ground to size, the diaphragm partitions allow it to advance automatically into the next compartment for further grinding within the same mill. Thus . . . a single power source and drive complete several grinding operations with important savings in equipment and handling costs.

Traylor's full line of Rod, Ball and Compartment Mills have these outstanding features in common: steel driving gears, precision cut with high and low addendum on our own MAAG gear generator; main bearings fitted with a high pressure lubrication pump to lift and float the mill for easier starting and to eliminate undue wear caused by "dry" starting. These features plus Traylor precision workmanship combine to provide smooth running mills that reduce maintenance costs and cut down-time losses.

Every Traylor Grinding Mill is built to specifications developed from data furnished by you, the customer. Traylored to your specific needs, they assure a uniform product . . . of the right size . . . with practically no over-grinding.

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Secondary Gyratory Crushers

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Jaw Crushers

Apron Feeders

Fuller vane type feeder discharging clay from bin to an Airveyor pneumatic conveying system.

When you need **Feeders**

see

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. . . pioneers in materials handling

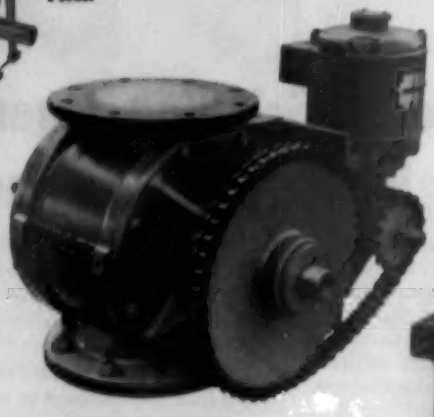
Designing and building feeders for handling dry pulverized and granular materials is nothing new for us . . . we've been making them for over a quarter of a century. We build them in many styles and sizes, for capacities of a few pounds a minute up to many tons an hour.

Standard line of feeders are built of cast iron, or combinations of iron and steel. We are also equipped to furnish you with feeders of special alloys to meet almost any desired individual requirement.

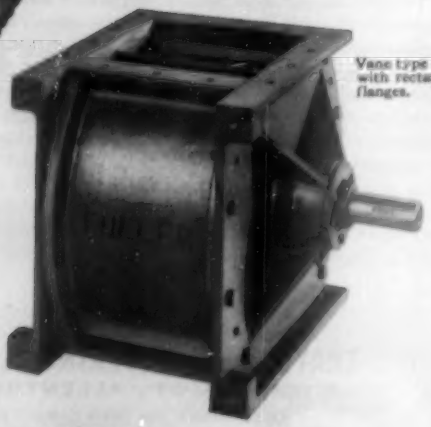
The Fuller Roll Feeder is especially adapted to handle dry, pulverized materials with volumetric accuracy, without pulsations. It will successfully handle materials such as pulverized coal, hydrated lime, cement raw materials and finished Portland cement.

Fuller vane type feeders are used for handling dry, pulverized and granular materials where extreme volumetric accuracy is not particularly essential. They may be used as air locks for positive or negative pressure differentials of up to approximately 7" Hg. (3-1/2 pounds) without appreciable loss. These feeders are built with stuffing boxes and ball bearings, for vacuum, low pressure, and general purpose uses, with circular or rectangular flanges. For complete descriptive information as to sizes, dimensions, and capacities write for Bulletin F-5, Fuller Feeder and Rotary Valves.

Fuller Roll Feeder



Vane type feeder with circular flanges. Rigid drive for minimum space requirements. Eliminates drive stress between feeder and related equipment.



Vane type feeder with rectangular flanges.

TYPICAL MATERIALS HANDLED BY FULLER FEEDERS

Aluminum Powder	Dry Spent Grains	Rock Dust
Arsenic	Feldspar	Rubber Pellets
Barley	Ferric Sulphate	Salt
Bauxite	Flaxseed	Salt Cake
Borax	Fuller's Earth	Saw Dust
Bran	Flue Dust	Shale
Calcium Acetate	Grits	Silica
Cellulose Acetate	Iron Oxide	Slate (crushed)
Celite	Kaolin	Soap Chips
Cement (Portland)	Lime (hydrated)	Soda Ash
Cement Raw Materials	Lime (pebble)	Soy Beans
Coal (crushed)	Lime (pulverized)	Stucco (hydrocol)
Coal (pulverized)	Malt	Wheat
Copra	Meals	Wood Chips
Corn	Middlings	Wood Flour
Corn Flakes	Resin (synthetic)	Zinc Calcine
Dried Blood	Rice	Zinc Sulphate

F-18
1794

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Equipment must operate like clockwork to produce 375 tons of crushed limestone per hour. And that's the way it works at this forty-year-old quarry of the Acme Limestone Company, Fort Spring, West Virginia, where Gulf Lubricants and Fuels keep shovels, cranes, drills, trucks, crushers, and other machinery operating at top efficiency.

In countless quarry operations Gulf Lubricants prevent excessive wear, keep maintenance costs at rock bottom levels. And Gulf fuels burn evenly and completely to insure top engine performance.

Then too, like the Acme Limestone Co., you will appreciate Gulf's service, which will help you select the right lubricants and fuels for every unit of equipment you operate.

Consult the telephone directory for the number of your nearest Gulf office and let us discuss how Gulf products and fine service can benefit your operation.

GULF

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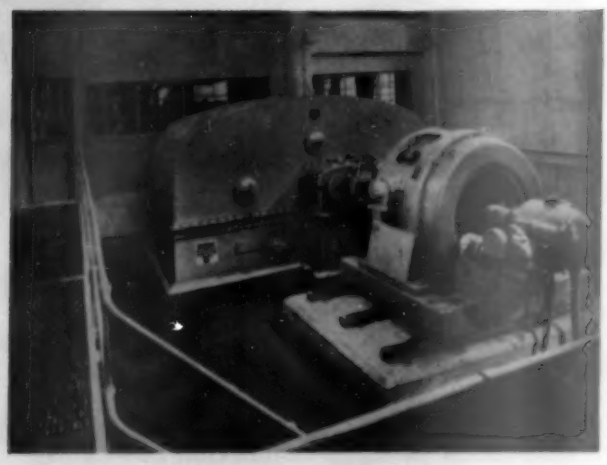
Years of continuous, reliable performance at highest efficiency and negligible maintenance.

Over 7500 HP transmitted through Symetro gears direct to trunnions of raw mills in cement plant illustrated above.



Driving station for large clinker mill showing motor and Symetro gear in separate enclosure (right).

For Smidth Machinery apply to:

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F. L. Smidth & Co. (Bombay) Ltd.
42 Queen's Road
Bombay, India

What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

September, 1955

Ferrophosphorus, a new alloy that will double the density of concrete walls used in atomic installations, has been developed by Victor Chemical Works. The combination of iron and phosphorus, mixed in standard concrete mixing equipment with water and portland cement, will increase the density of concrete from 150 lb. to almost 300 lb. per cu. ft. A major problem in construction of nuclear "hot cells" is that, previously, concrete walls had to be 6 to 8 ft. thick in order to provide adequate density to protect workers. Advantages of the alloy over scrap steel, previously used to increase density, is that it does not segregate out of the concrete mixture, does not rust, and is insoluble in acids. Ferrosphorus is produced at three of the company's seven plants: Mount Pleasant, Tenn.; Victor, Fla.; and Silver Bow, Mont.

Construction contract awards, in the 37 states east of the Rockies, totaled $11,982,771,000 for the first six months of 1955, according to an F. W. Dodge report. This was an increase of 30 percent over the same period last year, setting a new high for a first half year. Residential building contracts amounted to $5,456,730,000, a 37 percent increase over the first half of 1954; non-residential building contracts were $4,132,513,000 or 21 percent ahead of last year; and heavy engineering projects were $2,393,528,000, up 29 percent from the same time last year.

Exploratory drilling is being conducted offshore at Lake Parker, Fla., by a phosphate firm, although no full-scale mining operations have been planned. The firm has not applied for a state permit, as required by a recently established law, which resulted from protests by lakefront residents as to the possibility of mining the lake bottom.

A Conway, Ark., resident has apparently discovered a new use for cement. Hurrying to go fishing, he mistakenly sprinkled 10 quarts of cement on his onions, radishes, mustard and spinach. He reports that the vegetables are "several days' growth ahead" of another nearby untreated plot.

A deposit of Verde Antique marble has been discovered near Valdez, Alaska. It is a rare type of light jade green marble with bands of white, and is found only in a few other spots in the world. Of known deposits, one is in Italy, and one in the Blue Ridge Mountains of Tennessee. The deposit is said to cover about 60 acres, and is approximately one mile or more in depth.

Ohio Turnpike contractors face a stiff fine if their sections are not completed by October 1, 1955. Penalty clauses in their contracts provide that any contractor can be charged for the amount of traffic tolls lost because his section wasn't ready for opening. Traffic revenue experts have estimated this amount at $60,000 a day.

WHAT'S HAPPENING

Tornadoes, a record total of 110 in three days, in Texas, Kansas, Oklahoma, Missouri, Nebraska and Iowa, were reported to have caused damage amounting to more than $248,000,000. In Blackwell, Okla., a tornado destroyed and damaged 500 homes, injured 493 persons and killed 19. In Udall, Kan., 200 persons were injured, 73 killed, and 170 homes were destroyed, 16 damaged beyond repair, and only one left unscathed.

A national advertising campaign is being conducted by the Portland Cement Association, in an effort to demonstrate why concrete is the wisest choice for highway construction. Advertisements are appearing in the **Saturday Evening Post** and **Collier's,** pointing out safety factors, durability and economy advantages, and the advantages of concrete highways as a capital investment.

Lehigh Portland Cement Co. is preserving a 2500-year-old oak tree, whose roots reach into the coquina shell deposit at Ormond Beach, Fla., used by Lehigh in its cement production. The company has invited suggestions for the design of a protective fence, monument and plaque for the ancient tree.

A $25,000 award was made by a railroad recently to a man who claimed injuries he incurred when he was struck by the end gate of a gondola in 1952, had ultimately caused cancer. Three physicians had testified for the railroad, stating there was no connection between the cancer and his injury, as contradicted by a physician associated with a "cancer clinic."

Heavy construction awards, nationally, totaled $11,425,997,000 for the first 31 weeks of 1955, an increase of 35 percent over the comparable period in 1954, and 25 percent above the record for the period, set in 1953, as reported in **Engineering News-Record.**

The federal government's $40,000,000,000 investment in over 100 different types of tax-exempt businesses is getting smaller. The defense department has shut down 24 scrap metal operations, a caustic soda plant, and four ready-mixed concrete plants, among many others, in an attempt to eliminate some of the government's competition with private business.

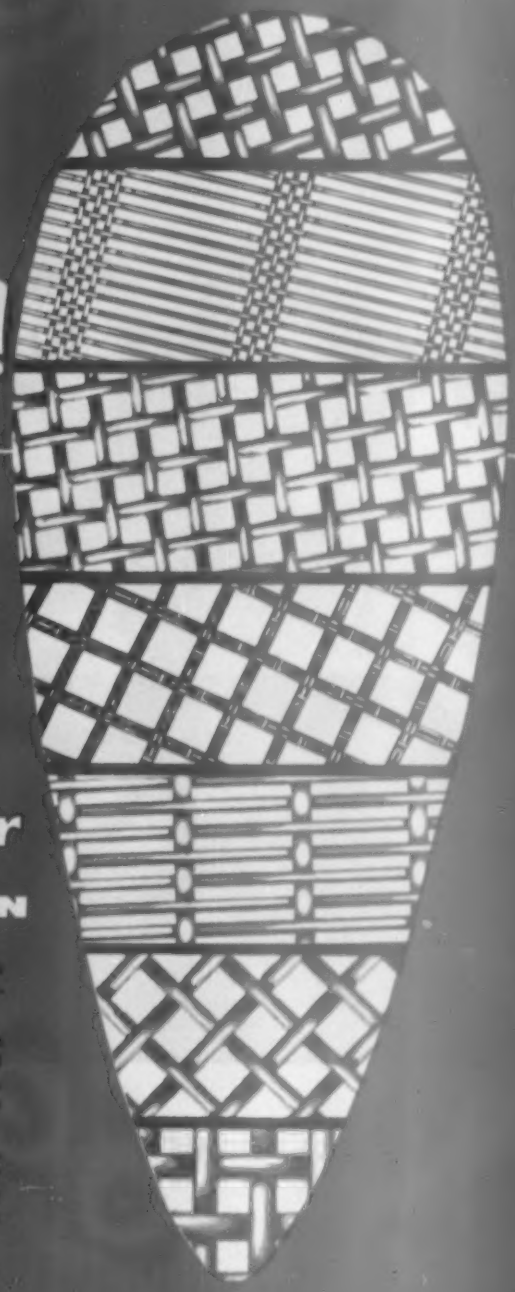
Treatment of soils with chemicals will provide a cheaper and longer-lasting means of road building in the near future, according to a statement made by Dr. Alan S. Michaels of the Massachusetts Institute of Technology. Research is still being conducted and the results are expected to be promising.

Seven loaded barges of the Blaske line were pushed to shore by Marquette Cement Manufacturing Co.'s harbour boat, "Little Dick," and four company employes, when the barges ripped loose upstream, during a 52 m.p.h. wind, and jammed near the Shippingsport bridge.

A growing cement shortage has been reported in southwest Texas, attributed to "prosperity, defense and good weather."

THE EDITORS

Greater Tonnage Per Screen Dollar!



Ludlow-Saylor
WOVEN WIRE SCREEN

- Longer life! Woven of super-tuff alloys with maximum durability and resistance to abrasion, set and fatigue.
- Greater accuracy! Pre-crimping and stress-free weaving prevent distortion of openings and eliminate wear at the crossover points. Insures precision sizing for the life of the screen.
- Top quality! All weaving equipment is designed and built in Ludlow-Saylor plants and is operated by craftsmen whose skills reflect 99 years of experience in wire cloth manufacture.
- Supplied in square or rectangular openings.
- Quick shipment! Most popular sizes and weaves in stock, saving downtime and cost.

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WIRE CLOTH COMPANY
502 South Newstead Avenue • St. Louis 10, Missouri

SALES OFFICES: Birmingham—1721 Sixth Ave., North • Chicago—5208 W. Division • Houston—1211 Capitol Ave. • Pittsburgh—Oliver Trust Building
WEST COAST: STAR WIRE SCREEN & IRON WORKS, INC., 2515 Bay Parkside Road, Los Angeles; subsidiary, Ludlow-Saylor Wire Cloth Co.

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New Data Book and Screen Selector packed with useful tables and helpful information. Write today!

GENERAL
REFRACTORIES
COMPANY
PHILADELPHIA 2, PA.

A Complete Refractories Service

Workmen installing a total of two hundred and eighteen feet of General Refractories GR-23 Insulating Fire Brick in a 12 foot diameter cement kiln.*

GR-23
INSULATING FIRE BRICK

for exposed rotary kiln lining...

General Refractories Company has sold insulating fire brick for exposed lining in cement kilns from Maine to Mexico, from California to Puerto Rico.* Several installations have already exceeded four and five years' life and are still going strong.

As a result General Refractories Company's GR-23 Insulating Fire Brick have been specified and bought for many of the new kilns* recently installed and now building in the cement industry's tremendous expansion program.

**Names and locations on request*

GENERAL REFRACTORIES

Withstands far greater SHOCK LOADS than any standard V-belt

Here are the interesting reasons why Gates Super Vulco Ropes stand up months, even years longer than *any* standard V-belts...

1. *Super-Strength Cords* provide 40% greater horsepower capacity . . . easily absorb heavy shock loads. **2.** *Flex-Weave Cover* (U.S. Pat. No. 2519590) provides greater flexibility with far less stress on the fabric. Cover wears longer — increases belt life, lowers belt costs.

3. *Concave Sidewalls* (U.S. Pat. No. 1813698) provides sure pulling power, longer wear because sides straighten out as belt bends— make even contact with sheave walls.

Straight-sided belts bulge out when bent around sheave

Uneven contact causes uneven wear.

SHOCK LOAD of this big jaw crusher at Canadian Quarries, Ltd. is absorbed by Gates Super Vulco Rope Drive. Wherever shock load is severe, Gates Super Vulco Ropes cushion the shock—keep machinery replacement cost down.

4 other outstanding advantages

Resists Oil, Heat and Weather: Long life is assured even in the presence of excessive oil . . . even under prolonged exposure to heat and weather.

Provides Static Safety: The high electrical conductivity of Gates Super Vulco Ropes provide safer drives in explosive atmosphere.

Has Little Stretch When Wet: Low moisture absorption eliminates need for special take-up in wet locations.

Saves Space: Higher horsepower rating and greater resiliency may permit fewer belts, or smaller sheaves where space saving is vitally important.

Gates SUPER Vulco Rope

The V-Belt with 40% more horsepower capacity

TPA 57

WHAT IS A WICKWIRE ROPE DISTRIBUTOR?

- He's quality people...handling quality products.
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- He brings you Wickwire Rope and Slings at the lowest possible cost, because he spreads his sales and distribution expense over the hundreds of related items he carries.
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CF&I WICKWIRE ROPE A CF&I PRODUCT

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

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Cut Downtime. . . .

on the St. Lawrence Seaway

INITIAL excavation for the Long Sault Dam on the St. Lawrence Seaway is right on schedule. On this project, as on all the excavation projects of the St. Lawrence Seaway, Firestone Nylon Tires are eliminating big downtime losses, giving more retreads and keeping tire costs at a minimum.

You can cut your costs with Firestone Nylon Tires because they are specifically engineered for the job. The treads give more traction and they are extra tough to resist cutting. Double-thick sidewalls give added protection against cuts and snags.

The new Firestone Safety-Tensioned Gum-Dipped* nylon cord body insures longer tire life and more retreads. The Firestone SafetyTensioned Gum-Dipped* nylon body gives the greatest protection against impact breaks . . . flex breaks . . .heat failures . . . and water damage.

Let your Firestone Dealer or Store show you how Firestone Nylon Off-The-Highway Tires will cut your downtime and increase your profits.

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A TIRE FOR EVERY ROAD, LOAD AND CONDITION OF SERVICE

GROUND GRIP • ROCK GRIP • GG WIDE BASE • ALL NON-SKID • ALL TRACTION • RIB EXCAVATOR

When you buy new equipment or replacement tires, specify Firestone

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

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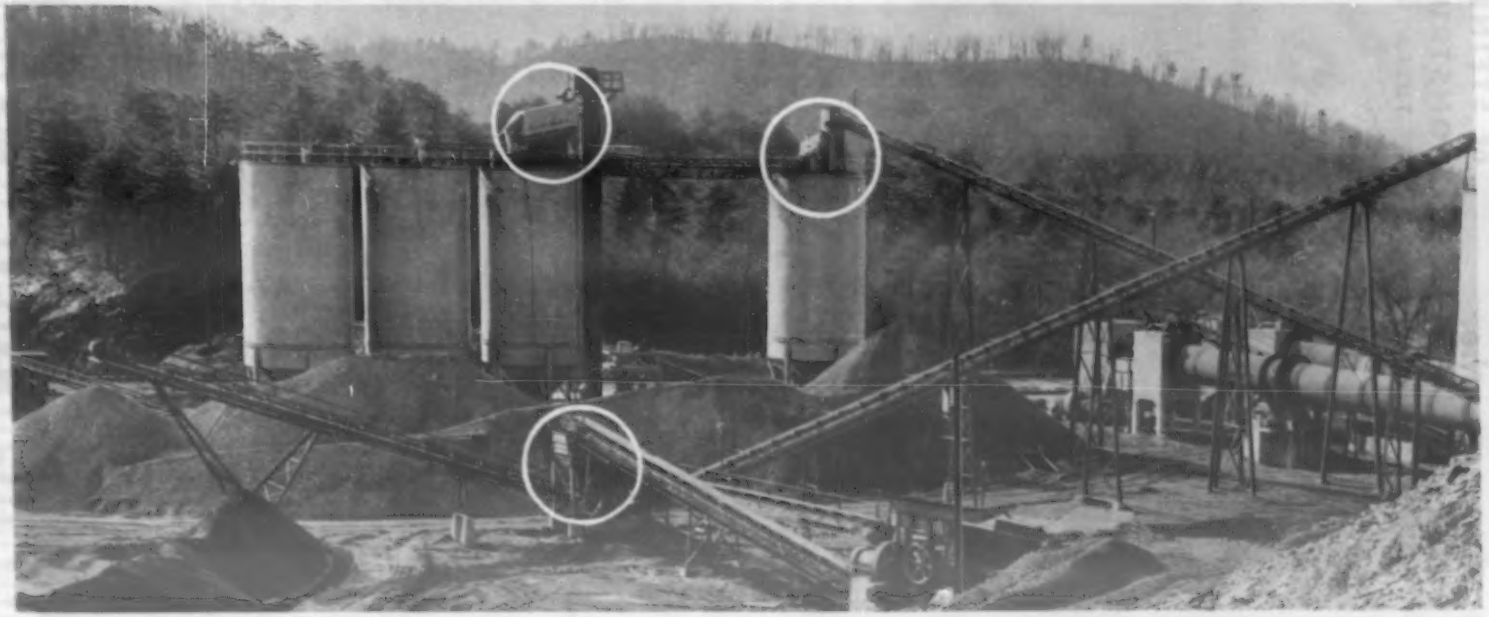
GEORGIA PRODUCER CHOOSES 4 SECO'S!

New Highly Mechanized Plant of Georgia Lightweight Aggregates is last word in efficiency



At Rockmart, Georgia, 45 miles northwest of Atlanta, is Georgia Lightweight Aggregates' new plant for the preparation of expanded shale aggregates.

In the photograph above, you see only a part of this highly mechanized, continuous flow operation designed by Otto C. Frei. In the complete process, Georgia Lightweight Aggregates quarries and converts Georgia slate into expanded lightweight aggregates. Four SECO vibrating screens are on the job here, handling total plant screening.

Marketed under the trade name "Galite," this lightweight, soundproof, water resistant, concrete structural material is winning new customers every day.

Planning a new plant or improvement of your present plant? We invite you to learn why SECO should be your choice of vibrating screens, too! Write, wire or phone.

SECO
TRUE CIRCULAR ACTION
VIBRATING SCREENS

SCREEN EQUIPMENT COMPANY, INC., Buffalo 25, New York

"Here's the plant that hits specifications easier and closer than any other plant we've ever operated . . ."

says **STREET BOYD**
of **STEINBERG-BOYD CONSTRUCTION CO.**
TULSA, OKLAHOMA

PAVING STONE		CLASS A	
OKLAHOMA SPECIFICATIONS	CEDARAPIDS PRODUCTION % PASSING	OKLAHOMA SPECIFICATIONS	CEDARAPIDS PRODUCTION % PASSING
100% passing 3"	100%	100% passing 1½"	100%
95-100% passing 2"	97.7%	90-100% passing 1"	95.9%
70-95% passing 1½"	85.1%	------passing ¾"	70.7%
50-85% passing 1"	61.7%	25-60% passing ½"	29.7%
-----passing ¾"	34.6%	-----passing ⅜"	12.4%
15-40% passing ½"	19%	0-5% passing No. 4	1.4%
-----passing ⅜"	10.6%		
0-2% passing No. 4	1.9%		

". . . and we're getting 180 to 250 TPH in Paving Stone, 140 to 160 TPH in Class A from our new Cedarapids Portable Crushing Plant."

You can hit specs right on the nose, too . . . outproduce any comparable plant . . . and do it at the low production costs that step up your profit. That's some of the reasons Steinberg-Boyd is so well satisfied with their new Cedarapids Unitized Portable Crushing Plant. It consists of a 2540 Portable Primary, an 1836 Twin Jaw Scalping Unit and the brand new Cedarapids Model 30C Secondary Plant featuring the Symons Cone Crusher. It's a plant designed to meet the big output and exacting gradation demands of modern turnpikes and toll roads.

Best of all, this set-up has all the features that *make money for you* on every job.

THESE EXCLUSIVE CEDARAPIDS FEATURES ASSURE BETTER GRADATION BIGGER PRODUCTION LOWER OPERATING COSTS

1. VIBRATING GRIZZLY
. . . by-passes most of the undersized material and fines. Increases primary output up to 25%.

2. TWIN JAW CRUSHER
. . . increases primary crushing production up to 40% over single jaw units and is especially efficient in abrasive rock or gravel.

3. HORIZONTAL VIBRATING SCREEN
. . . steps up screening capacity because the horizontal position of the screen cloth gives 12½% more screening area than an inclined screen of the same length.

4. SYMONS® CONE CRUSHER
. . . produces high tonnages of uniform, fine-crushed aggregate, even in the hardest or most abrasive rock or gravel. The Symons Cone Crusher, built by Nordberg, and world famous for big-volume, low-cost operation, has been combined with Cedarapids mobility and quality construction to give you a portable plant with the high-profit features of a permanent installation.

Cedarapids
Built By IOWA

IOWA MANUFACTURING COMPANY
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Model 1600 — iron ore, Mesabi Range, Minn.

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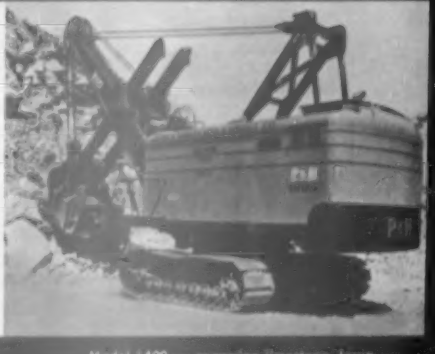
Model 1600 — handling slag, Alabama

Model 1855 — stripping bituminous, Pennsylvania

Model 1400 — mining asbestos, Northern Quebec



Model 1400 — quarrying limestone, Iowa

From tail cable connection to dipper teeth — one responsibility — All P&H

Today, P&H leadership in *electric* shovel developments is more pronounced than ever. Such outstanding features as all-welded construction throughout and Magnetorque* hoist drive are combined with electrical equipment which is designed and built specifically for electric shovel service — not adapted for it. And now, P&H has stepped ahead with *Electronic Control* as standard on all P&H Electric Shovels. Get the facts. Harnischfeger Corporation, Electric Shovel Division, Milwaukee 46, Wisconsin.

*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

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the P&H Line

EDITOR'S PAGE

Outlook for Expanded Highway Building Has Improved

DEFEAT OF ALL FEDERAL HIGHWAY LEGISLATION in this past session of Congress came as a great surprise and disappointment to many. It was unexpected but the result is anything but an indicator that the highway building program will suffer in the long run.

A vast highway building program of the scope originally proposed by President Eisenhower has been merely set back on the calendar for further consideration. There are those who believe that highway legislation involving added taxes won't have a chance in 1956 which is an election year but partisan politics are unlikely to hold up action for very long.

No attempt has been made by the President to gain political capital because of the fact he initiated the thinking that an expanded highway program must be undertaken. The long drawn-out discussions and energetic debate in the 1955 Congress have proved that there is complete agreement with the President's warning that critical deficiencies in the nation's highway system must soon be corrected. There is no argument about the need and it will boil down to some agreeable compromise on how the program is to be financed.

Behind failure of the 1955 Congress to act there was a mixture of procrastination, time delays that invited opposition, political power, prestige and the pressures of interested groups.

Bills Defeated

Originally the administration's program, calling for 101 billion dollars worth of highway building over a ten-year period, called for a revenue bond issue to finance much of the federal government's part of the cost of construction for inter-state highways. This report, as submitted by the Clay Committee, was doomed by those in Congress who insisted that a pay-as-you-go plan for financing was essential.

Other bills were proposed as alternates and, finally, the Fallon bill which called for increased highway user taxes to foot the expense was defeated. This proposal which hiked taxes on gasoline, fuel oil, truck tires, etc., and levied high excise taxes on trucks met with a storm of protest from truckers and the petroleum and rubber industries even after it was modified.

The only agreement that came out of all the debate was that everyone wants a road bill but no one wants to pay for it. There no longer is need to sell the fact that lack of adequate roads is costing needless loss of human lives and an economic loss of billions of dollars annually in delays, property damage, high insurance premiums, hospital and funeral bills.

Passage of suitable legislation may be expected, and likely by the 1956 Congress, which might reflect the thinking of many in Congress that, since all people benefit from highways, all should bear their proportionate share in financing the enlarged program. The bill as it will pass may provide for added taxes as well as bond financing for a compromise, but our guess is that a pay-as-you-go system will be established.

Paying for Highways

This may take the form of an increase of a cent or so in federal motor fuel taxes, probably increasing the intake from highway users by fifty percent. If diversion of these funds could be eliminated, financing would then be adequate for a greatly enlarged highway building program. The present level of government spending for federal-aid roads is 875 million dollars annually which is roughly about one-third of what the government is taking in by taxes.

One of the objectives in the original proposal by the administration, to provide bond issue financing, undoubtedly was so that the individual States would have leaway to raise highway motor fuel taxes sufficiently to carry out their part of the highway program. The elimination of diversion at the federal level instead of raising the federal tax ante would go a long way in helping the States solve their fund-raising problems.

Making up for the deficiency in highways may necessitate special efforts to raise funds but that is temporary and the laws should provide for financing on a long-term plan based on continued development beyond any prescribed period. There will always be needs for highway development in our growing economy and the two-year authorization policy for federal aid now in effect should be scrapped in favor of a plan that is far-reaching into the future.

Congress' lack of action has not hurt business for the highway construction industry since appropriations for this year and next were already made. The full impact of the accelerated program would not have been felt until 1956 or 1957. In 1955, the construction and maintenance of highways will surpass 1954 by ten percent anyhow.

What it has done is snarl the highway plans of the states, which were waiting to gear their programs to the federal plans. Shoving plans back a year or more also makes it difficult for cement manufacturers and others in the rock products industries to plan ahead with any certainty.

Bror Nordberg

Protection
Under ALL CONDITIONS of Grinding Operation

Protection requirements vary. That's why Allis-Chalmers control is recommended and applied with expert, personal attention to the specific problem at hand. For example, the starter illustrated is custom-engineered to control a 1000-hp, 2300-volt synchronous motor driving a ball mill. Its protection features not only meet regular operating requirements but also handle unusual emergency conditions. These features include:

- **Current-Limiting Fuses**
- **Thermal Overload Relays**
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For complete information, see your A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

Optional Features:

Exciter voltage relay to prevent starting when excitation voltage is not available; dc field failure relay to shut down motor on field current failure; instantaneous phase reversal and open phase; inching control for positioning mill.

A-4703

ALLIS-CHALMERS

A Helpful Book on Geology

ROCKY'S NOTES

NATHAN C. ROCKWOOD

NOT INFREQUENTLY we learn that some of our readers are interested in new textbooks on geology. Certainly no group in industry should be more interested than those whose livelihood comes from mining and processing "rock products." These are the results of geological processes, to which cement, lime and gypsum manufacturers and the producers of sand, gravel, crushed stone and other mineral commodities are merely extending the processes begun by Nature to obtain marketable products. Hence every producer is a practicing *geologist* whether he professes it or not.

A new book on "Geology: Principles and Processes,"* by William H. Emmons, late professor of geology, University of Minnesota; George A. Thiel, professor of geology, University of Minnesota; Clinton R. Stauffer, professor emeritus of geology, University of Minnesota, research associate, California Institute of Technology; Ira S. Allison, professor of geology, Oregon State College, is ideally written and illustrated for the lay reader. It is a fourth edition, revised and reset, "designed to challenge the interest of the student looking for a cultural course in natural science, and at the same time provide a sound basic presentation for the student who plans a major in earth sciences." So states the preface, and text seems to have amply fulfilled this purpose.

What Rocks are Made of

Of special interest is Chapter 3 on "Elements, Compounds, Minerals, Rocks," for here is described in readily understood language the nature of matter, behavior of electrons, atomic weights and atomic numbers, crystals, origin of minerals, their composition and physical properties, descriptions of the common minerals, their combination in rocks. The text on atomic structure is particularly helpful, for this is generally a difficult subject for the uninitiated. The authors define "mineral" in a *geological sense* as "a naturally occurring inorganic substance with a characteristic internal structure and with a chemical composition and physical properties that are either uniform or variable within definite limits." However, they admit that the term also has broader meanings, and evidently we have not been so far off base, as some of our readers protested, when we have referred to portland cement or lime as a mineral, or an industrial mineral.

The following Chapter 4 on "Atmosphere, Weather, and Climate" explains the various agencies that are perpetually at work to change the surface of the Earth. The succeeding chapter on "Rock Weathering and Soils," describes how these various natural agencies work. No researcher on cement, concrete and aggregates, or anyone else interested in studying the making, placing and testing of concrete, can have an understanding of the subject, regardless of his laboratory experiments and experience, if he is not well informed on Nature's own processes of testing durability.

Natural Gradation of Sizes

The next three chapters, 6, 7 and 8 describe the work of the wind, ground water and mass movement of surface materials in sorting and sizing the products of rock disintegration. This, of course, bears directly on the formation of sand and gravel deposits and numerous other sources of rock products. The chapter (9) on rivers and valleys could be of real help to producers and prospective producers, who must learn something of the habits of streams in their search for deposits of raw material. The sorting of sand into the various sizes demanded for present-day mortar and concrete is largely based on further development of natural processes.

The effects of snow, ice and valley glaciers (chapter 10) are what laboratory technicians try to imitate in their freezing and thawing tests. One can hardly evaluate such tests successfully without considerable knowledge of the action and effects of such processes in Nature.

Chapter 15 is on "Sedimentation and Sedimentary Rocks." (The intervening chapters are on oceans and beaches.) This has always been an intriguing subject because to all practical purposes concrete is a sedimentary rock, man-made. The principal cements that Nature uses are dissolved calcium carbonate (bicarbonate) and dissolved silica, although both may be colloidal sols rather than true chemical solutions. The final exposé of the binding properties of portland cement may show they are little else. The strength of the bonds between particles, in both instances apparently, depends on how closely they are packed —in Nature, how much pressure has been applied.

Volcanic Phenomena

If one is seeking volcanic ash, or volcanic rock that can be pulverized to make a pozzolan, he should certainly want to know where in this country there have been volcanoes. He can get a pretty good idea from Chapter 16. Moreover, when one makes portland cement he is imitating Nature's volcanic processes, and apparently ends up with something quite similar to the product of a volcano. The mineral afwillite (a natural, hydrated calcium silicate), from which researchers are finding out something about the possible crystal structure of portland cement, is a freak volcanic product, found originally in California.

Igneous rocks are described in Chapter 17. Aggregate producers are learning to distinguish the properties of acidic or silicic rocks, because of the furore raised over the possibility of alkali-aggregate reaction in concrete. The same kind of rock that causes trouble as a coarse aggregate or sand, usually makes a good pozzolan when pulverized, so quarry operators in acidic rock may eventually find a more profitable business in pozzolans than in aggregates.

A chapter on diastrophism and its resulting structures explains how the Earth's crust has been warped and folded to account for some of the strange formations often encountered in quarrying operations. Of course, as every quarryman knows, a knowledge of these conditions locally is of great practical importance. Nevertheless, lack of knowledge of such conditions has caused many a failure.

Metamorphism

Our authors define "metamorphism" as "the sum of the processes that transform rocks and minerals to different kinds of rocks and minerals." * * * * "The rocks that are in stable equilibrium under one set of conditions may be unstable under another set, and consequently an adjustment to the new environment tends to take place

(Continued on page 74)

*McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York 36, N. Y.; Price $6.50.

MORE & MORE *New York* AGGREGATE PRODUCERS ARE PROFITING WITH EAGLE WASHING-CLASSIFYING EQUIPMENT!

In New York state, as everywhere else, sand and gravel producers are learning that you can't beat Eagle Equipment for doing a fast, clean aggregate washing and sand classifying job that enables them to meet rigid specifications . . . and Eagle Equipment does the job economically too. This is natural since Eagle pioneered modern aggregate washing and classifying equipment, Eagle has the broadest experience and the most complete line, and Eagle's service policy assures 100% user satisfaction.

PINE HILL CONCRETE MIX CO.,

Bowmansville, N. Y., uses three Eagle Fine Material Screw Washer-Classifier-Dehydrators at their plant . . . two of the screw units process concrete sand, the third unit processes mason sand . . . material that meets specifications . . . material that assures quality concrete. "Produces material faster than we expected," they report.

EASTERN ROCK PRODUCTS, INC.,

Barneveld, N. Y., readily meets N. Y. state specifications with their Eagle set-up consisting of a 16' water scalping-classifying tank with 3-cell collecting-blending flume and a 36" dia. x 25' single screw fine material unit, producing concrete sand. Mason sand is produced by two older screw units . . . both gradations readily meet the test.

These are typical examples of New York plants that have solved the problem with Eagle Equipment. Get the facts—ask for Catalog 55.

EXPERIENCE, PROGRESS, SERVICE SINCE 1872

EAGLE IRON WORKS

137 HOLCOMB AVE., DES MOINES, IOWA

All four plants of the McLELLAN STONE CO. are TELSMITH Equipped

● The McLellan Stone Co. operates four Telsmith-equipped crushing plants in the south central part of Kentucky. These plants produce crushed stone which meets Kentucky state highway specifications, as well as aggregate for local construction purposes. The company has been in active operation for over forty years under the guidance of the late James B. McLellan. The four plants are now operated by his sons George, David, Robert and William McLellan. These plants include four Telsmith Heavy-Duty Apron Feeders, four Telsmith Primary Crushers, six Telsmith Secondary Crushers, and twelve Telsmith Vibrating Screens. The McLellans are well satisfied with Telsmith Equipment.

Send for Bulletin 266.

TELSMITH equipment in these McLellan plants

- 36" x 14' Heavy-Duty Apron Feeder
- 36" x 12' Heavy-Duty Apron Feeder
- Two—36" x 10' Heavy-Duty Apron Feeders
- Two—18" x 32" Jaw Crushers
- 20-B Gyratory Crusher
- 16-B Gyratory Crusher
- 10-B Gyratory Crusher
- 48-S Gyrasphere Crusher
- Three—36-S Gyrasphere Crushers
- 36-FC Gyrasphere Crusher
- 4' x 10' Heavy-Duty Scalper
- Eleven—4' x 12' Vibro-King Screens

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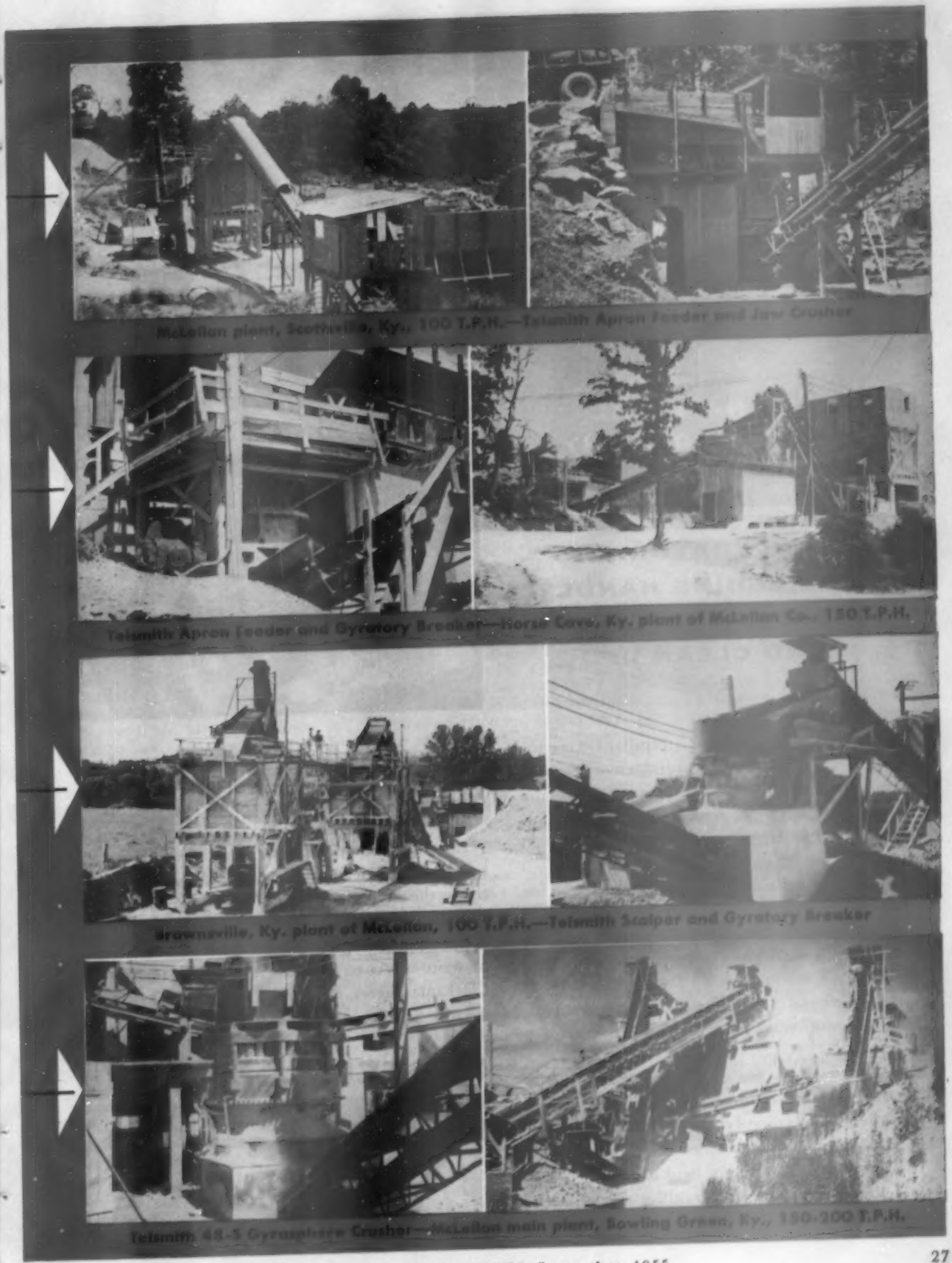


McLellan plant, Scottsville, Ky., 100 T.P.H.—Telsmith Apron Feeder and Jaw Crusher

Telsmith Apron Feeder and Gyratory Breaker—Horse Cave, Ky. plant of McLellan Co., 150 T.P.H.

Brownsville, Ky. plant of McLellan, 100 T.P.H.—Telsmith Scalper and Gyratory Breaker

Telsmith 48-S Gyrasphere Crusher—McLellan main plant, Bowling Green, Ky., 150-200 T.P.H.

TRACTOR HYSTAWAY® COMBINATION

CUTS COST

CUTS COST

FOR NATIONAL CEMENT COMPANY

ONE OPERATOR AND ONE MACHINE HANDLE SECONDARY BREAKING AND CLEAN UP

A Hystaway mounted on a Caterpillar D8 tractor has proven to be a highly productive piece of equipment at the National Cement Company quarry near Ragland, Alabama. This operation works a 50-55 foot face and crushes 15 to 20 hundred tons of limestone per 8-hour day.

Hystaway combines crane and bulldozer in one machine, which means that one operator and one machine are doing a job that usually requires two separate machines (crane and tractor).

Using a 4,800-lb ball on a 30-foot boom, Hystaway performs all of the secondary breaking *plus* clean-up work—keeps productive all day—every day.

Handy machine for maintenance work—able to travel at tractor speeds, the Hystaway can be rapidly moved around to handle small jobs such as lifting screens and motors on crusher repairs, building and maintaining haul roads.

Quickly convertible to dragline, shovel, backhoe, clamshell, pile driver, Hystaway can be mounted fast — without alteration or special equipment—on Caterpillar D6, D7, D8 tractors.

If you are now using two separate machines (crane and bulldozer) to handle secondary breaking and clean-up, it will pay you to investigate the savings in operating costs made possible by the Hystaway-Tractor combination.

See your Caterpillar-Hyster dealer for details, or write direct to Hyster Company, 2918 N. E. Clackamas Street, Portland, Oregon, or 1818 N. Adams St., Peoria, Illinois.

HYSTER COMPANY

"Matched Design" Tractor Tools for Caterpillar-built Tractors

HYSTER

LABOR RELATIONS TRENDS

By NATHAN C. ROCKWOOD

Holiday and Premium Pay Dispute Decided in Favor of Cement Co.

EMERGENCY REPAIRS which required holiday work by two members of the Machinists and Electrical Workers Unions (A.F. of L.) involved a difference in the interpretation of contract clauses covering premium and holiday pay rates. This dispute at the Oswego, Ore., plant of the Oregon Portland Cement Co. was decided by a single arbitrator, E. P. Marsh, selected by both parties to the controversy from a list of arbitrators submitted by the Federal Mediation and Conciliation Service. What follows is taken from his report.

Facts in Case

"On February 3, 1955, the above entitled parties notified the Federal Mediation and Conciliation Service that a dispute had arisen resulting in arbitration under the terms of the labor contract. Article 15 of said contract provides that the Federal Mediation and Conciliation Service shall submit a list of names from which an impartial member of the arbitration board shall be chosen. Complying with the request, the Service submitted a list; and E. P. Marsh was selected as the third board member. On February 24, 1955, Mr. Marsh was notified by the Service of his appointment. The parties were contacted by Mr. Marsh, and a date of hearing set for March 8, 1955.

"The parties agreed to waive that portion of the contract providing for a three-man arbitration board, and allow Mr. Marsh to be sole arbitrator.

"The company has contractual relations with the Machinists and Electrical Workers Unions, negotiating and signing an identical contract with both unions. The work performed is shop repair and maintenance. The machinists have one assigned shift daily, 8:00 a.m. to 4:30 p.m. with ½ hr. deducted for a lunch period. The contract provides an 8-hr. day, 40 hr. per week, with time-and-one-half paid for work performed in excess of those hours and for the sixth day of an assigned work week. Double time shall be paid for all time worked in excess of 12 hr. in one day, on the seventh consecutive day of an assigned work week and on specified holidays. Among the specified holidays on which straight time shall be paid if not worked is Armistice Day. The contract further provides that double time shall be paid for all time worked on the designated paid holidays.

"On November 11, 1954, a breakdown occurred which necessitated the calling to work of two machinist shop men. Their normal working hours were 8:00 a.m. to 4:30 p.m., Monday through Friday. Neither man was scheduled to work November 11. They were called to work that evening, commencing at 9:30 p.m. They worked 6½ hr. and were paid double time for 6½ hr., and straight time for 1½ hr. The union contends they had earned the holiday pay of straight time at 4:30 p.m. and were entitled to an additional double time for the 6½ hr. worked.

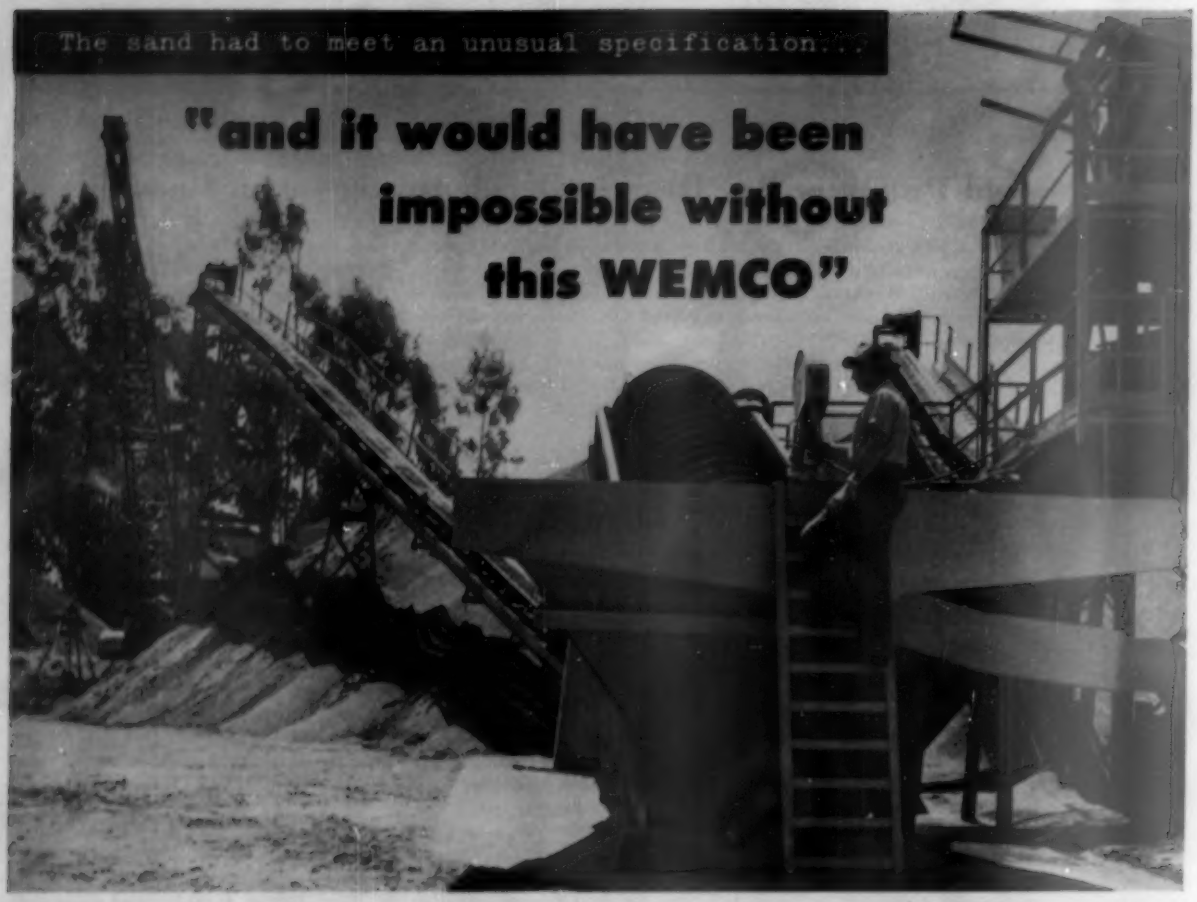
Union Argument

"It was the general understanding of the union that work performed on a paid holiday outside of the regular shift hours would be paid double time in addition to the holiday pay. The shop steward, testified in a written deposition that 'we never considered pay for work outside our regular shift on holidays, but had I been called in to work I would have expected double time for all hours outside my regular shift in addition to holiday pay. I have discussed this with the other workmen and that is their understanding also.' Both the workmen involved testified in writing 'since the granting of paid holidays in 1952 and until November of 1954, I have never been required to work a holiday on any other than my regularly scheduled shift. The business representative of the Electrical Workers' Union, testified that his understanding of the agreement and the intent he read into it was: that if a man worked on a holiday during his regular hours of work he would be paid double time. If he did not work, he would receive straight time for that day. If he had been off the full holiday and came to work after his regular working hours, he would receive full holiday pay of straight time plus double time for work performed after the close of the regular assigned work day. He testified further, that if one of his members had been called in completely outside his regular working shift and filed a grievance over the pay received, he would have processed the grievance. The business representative of the Machinists Union testified that not to his knowledge had any men been called on a holiday outside the regular shift hours, other than the two men parties to this grievance; that had any other such grievances been filed, he would have processed them in the same manner as in the instant case. Under the company's interpretation, a man could be called in at 9:00 p.m. the night of a paid holiday, work until 4:30 the next morning—actually working for straight time all night—as he would have received eight hours pay if he had not worked at all. It was never the intent of the union to have a man called in the middle of the night and work for straight time. Had any consideration been given to hours worked outside the regular shift, the language would have been contained in the agreement that it was the understanding of all parties that that related to the regular assigned shift.

Company Argument

"The hours of work of the shop employes are 8 hr. a day Monday through Saturday with a breakdown upon the short shift on Saturday and short shift on Monday, with one man working on Sunday. On holidays only one man is kept on regular shift from 8:00 a.m. to 4:30 p.m. The workday is 24 hr. from the 8:00 a.m. starting time. If a breakdown occurs on a holiday, additional shop men must generally be called. They do no work other than to repair the breakdown. Except the one man assigned to a regular shift, no other shop employes have assigned work on paid holidays. During the 1952 negotiations there was no discussion over the specific hours that might be worked on holidays. The proposal adopted was double time for all time worked, and that provision is still in the contract. In the 1953 negotiations the union proposed double time plus holiday pay, or triple pay for all time worked — regardless of what hours worked. This proposal was not adopted. In the 1954 negotiations a proposal was made for two and one-half times straight time worked for work performed on a holiday. In lieu of this proposal three weeks' vacation after ten years' employment was accepted by the union and placed in the contract. The company has consistently interpreted the agreement and paid accordingly the premium pay, or dou-

(Continued on page 108)



When the Niles Sand and Gravel Company got the sand and aggregate order for the Ford Motor Company's new assembly plant in Milpitas, California, it was on the basis of an exceptionally rigid sand requirement. It has now been successfully fulfilled, and H. G. Clouser, Niles plant superintendent, reports, "this would not have been possible except for the adaptability of our 60-inch Wemco Sand Preparation Machine".

With 60,000 yards of concrete being poured on this one Ford plant, the fineness modulus was not permitted to vary more than 0.2%. Plus 200 mesh fines had to be retained in correct proportion and – 200 mesh had to be eliminated as completely as possible. A continuous materials testing program was under the direction of Hales Laboratories of Oakland.

After his experience on these very exacting requirements, Mr. Clouser of Niles Sand and Gravel Company states, "I believe that the Wemco Sand Preparation Machine, intelligently used, can meet practically any desired sand specification." "It has proven particularly adaptable to various operational changes we have made." "The hydraulic screw lift makes it readily adjustable to day-to-day pit variations." "And it has been one of the most troublefree pieces of equipment in our plant (three years running on its original wear shoes)."

For descriptive literature, write Dept. J-2442.

Plant operator Tom Brannon using the hydraulic spiral lift. This simple adjustment compensates day-to-day pit variations, and in locations where freezing is a problem may also be used to break surface ice (eliminating the need for draining the tank for overnight shutdown).

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PEOPLE

IN THE NEWS

Penn-Dixie Appointments

M. L. SILCOX, vice-president of Penn-Dixie Cement Corp., New York, N. Y., has also been appointed general operating manager with headquarters at the Nazareth, Penn., plant. He succeeds E. P. Newhard, vice-president and operating manager, who has retired after 45 years of service with Penn-Dixie and its predecessors.

M. L. Silcox

Mr. Silcox, who will be in charge of all operating and engineering activities, became associated with Penn-Dixie's predecessor, Clinchfield Portland Cement Co., in 1921. From 1926 to 1945 he was chief chemist for Penn-Dixie, became superintendent at the Clinchfield, Ga., plant in 1945 and assistant operating manager in Chattanooga, Tenn., in 1952.

E. P. Newhard

Mr. Newhard, after specialized training at Muhlenberg College, Allentown, Penn., joined the Atlas Portland Cement Co. He served several years as chemist with Giant Portland Cement Co. before joining Clinchfield Portland Cement Co. as chief chemist in 1918. He was chief chemist of the southern division of Penn-Dixie from 1926 to 1932 with headquarters at Chattanooga, at which time he was appointed superintendent of the Clinchfield, Ga., plant. From 1944 to 1948 he was general chemist in charge of chemical control and research at Nazareth, Penn. He was appointed general operating manager in 1948 and vice-president in 1950.

Assistant to Vice-President

HENRY E. WESSEL, formerly with the Midwest Research Institute, Kansas City, Mo., has joined the engineering division of International Minerals and Chemical Corp., Chicago, Ill., as assistant to the vice-president. Gordon F. Palm, who has been teaching chemical engineering at the University of Houston, Houston, Texas, since 1953, has been appointed a member of the chemical engineering group; Russell C. W. Crom, sales engineer with Westinghouse Electric Corp., El Paso, Texas, since 1952, has been named a member of the electrical department, and Frederick L. Brandau, plant engineer with American Viscose Corp., Parkersburg, W. Va., has become a member of the mechanical engineering group.

Assistant General Chemist

HERBERT W. DIECKMANN, assistant plant manager at the Leeds, Ala., plant of Universal Atlas Cement Co., New York, N. Y., has been appointed assistant general chemist in the New York office. Born in Mason City, Iowa, Mr. Dieckmann graduated from Georgia Institute of Technology, Atlanta, Ga., with a B.S. degree in ceramic engineering. He also took postgraduate courses in chemistry at Pennsylvania College. From 1932 to 1941, he was associated successively with the Mason City Brick and Tile Co., Twin City Brick Co., and the Northwestern States Portland Cement Co. as engineer and chemist. Mr. Dieckmann joined Universal Atlas in 1941 as chemist at the Northampton, Penn., plant where he was appointed assistant chief chemist in 1943 and chief chemist and inspector in 1946. Three years later he was transferred to the Leeds, Ala., plant as assistant plant manager.

Herbert W. Dieckmann

Receives Honorary Degree

JOHN R. THOENEN, chief of the Mineral Industry Division, Region VII, of the U. S. Bureau of Mines, Knoxville, Tenn., was honored at commencement exercises held recently at Michigan College of Mining and Technology, Houghton, Mich., when he was presented with an honorary master's degree in engineering by Dr. Grover C. Dillman. A native of Sault Ste. Marie, Mich., Mr. Thoenen also attended Michigan State College, Lansing, Mich. He has spent 47 years of his life in the mining profession, from survey man through positions of foreman, superintendent, general manager and consulting engineer for mining companies in the United States, Canada and Greece.

Ideal Personnel Changes

CHARLES J. NOYES has been appointed sales manager of the Oklahoma division, Oklahoma City, of Ideal Cement Co., Denver, Colo., succeeding P. A. Thompson who has

retired. Carroll Nordean has been promoted to sales manager of the Arkansas division, Little Rock, Ark., to succeed S. R. Brooks, who has also retired. M. R. Shilling has been named sales manager of the Alabama division, Mobile, Ala., succeeding H. R. Marriott, Jr., who has been assigned to other duties. M. O. Matthews, Jr., assistant sales manager, Mobile, Ala., has been transferred to Oklahoma City in the same capacity.

Ohio Lime Officials Retire

FRED WITMER AND E. J. NIEMAN have retired as president and vice-president, respectively, of Ohio Lime Co., Woodville, Ohio. Mr. Witmer will be succeeded by A. H. Nieman, formerly chemist. Franklin Witmer, sales manager, has been elected vice-president and general sales manager and Frederick D. Witmer, Jr., engineer and purchasing agent, has been appointed general manager.

Mr. Witmer started his career in the lime business with Warner Co. at Philadelphia, Penn., and Wilmington, Del., in the early 1900's. In 1916, together with E. J. Nieman and others, he founded the Ohio Lime Co. and became president in 1926. He will continue to serve in an advisory capacity. Mr. Witmer has served as a director of the National Lime Association, Washington, D. C., for many years and as an officer of the Finishing Lime Association of Ohio.

Secretary-Treasurer

ROBERT W. LEFFERTS, controller, has been elected secretary-treasurer of Penn-Dixie Cement Corp., New York, N. Y., to succeed George Kilian, who has retired after 47 years of service.

Mr. Lefferts has been controller of

Robert W. Lefferts

George Kilian

Penn-Dixie since 1950. He received his A.B. degree from Columbia College and an M.S. degree from Columbia University School of Business. He is a certified public accountant, a member of the American Institute of Accountants and the New Jersey Society of Certified Public Accountants.

Mr. Kilian has been associated with the cement industry for more than 50 years, and has been secretary of Penn-Dixie since 1926. He was secretary-treasurer of the Dixie Portland Cement Co., Chattanooga, Tenn., from 1908 until the company merged with Penn-Dixie Cement Corp. He is a past chairman of the Audit Committee of the Portland Cement Association, Chicago, Ill., and was one of the organizers and chairman of the Cement Credit Division of the National Association of Credit Men.

Executive Vice-Presidents

C. GLENN BROWNING, vice-president and general sales manager, has been elected executive vice-president of sales for Lehigh Portland Cement Co., Allentown, Penn., and P. A. Groll, vice-president and operating manager, has been named executive vice-president of manufacturing.

Mr. Browning joined Lehigh in 1921 as a sales clerk in Allentown. After serving as sales representative, he became district sales manager at Richmond, Va., in 1932, division sales manager in 1936, and eastern sales manager in 1946. He has been vice-president and general sales manager since 1947, and was elected a member of the board of directors in 1954.

Mr. Groll became associated with Lehigh in 1925 as a chemist at the Alsen, N. Y., plant. In 1934 he was appointed chemist at the Oglesby, Ill., plant and in 1945 was named plant manager. He moved to Allentown in 1949 as assistant operating manager and became vice-president and operating manager in 1954.

Heads Gravel Firm

CARLETON J. LEWIS has been elected president and treasurer of the Buffalo Gravel Corp., Buffalo, N. Y. Formerly vice-president, he succeeds Edgar B. Maloney, who has resigned to devote more time to travel and personal affairs. Harry T. Hawkins, formerly sales manager, has been appointed vice-president in charge of sales, and William I. Morey, attorney, has been named secretary.

Elected Vice-President

JOHN C. FITCH, manager of the Houston, Texas, plant of The Geo. Rackle & Sons Co., Houston, Texas, has been elected vice-president of the company and general manager of the southwest division. Mr. Fitch joined the firm in 1949 as sales manager when the southwest division was formed in Houston. In 1952 he was named manager of the Houston plant.

Service Engineer

JOHN C. WYCOFF has been appointed service engineer for the Southern Lightweight Aggregate Corp. (Solite Corp.), Richmond, Va. A graduate in engineering from Virginia Polytechnic Institute, Blacksburg, Va., Mr. Wycoff was formerly district materials engineer with the Virginia Department of Highways.

Form Sandstone Company

EVERETT W. WARREN, formerly superintendent of the Acme Limestone Co., Fort Springs, W. Va., with Howard W. Fields and Robert T. Lowe, has formed the Fields Rainbow Sandstone Quarries, Inc., Alderson, W. Va. The firm has been incorporated for $75,000.

General Operations Manager

WALTER E. COLE, JR., has been appointed operations manager of Columbus Builders Supply, Inc., Columbus, Ohio. He has been with the company since 1949.

Association Vice-President

RUSSELL S. RAREY, president of Marble Quarries Co., Columbus, Ohio, was recently elected first vice-president of the Columbus Industrial Association.

OBITUARIES

HARMON S. MEISSNER, head of the Structural Properties of Concrete and Foundations Section, Division of Engineering Laboratories, Bureau of Reclamation, Denver, Colo., died July 22 after an illness of several months. Widely recognized as an authority on cement and concrete, Mr. Meissner was born at Ogden, Utah, and received his B.S. degree in civil engineering from the University of Utah, Salt Lake City, and his M.S. degree from George Washington University, Washington, D. C. During his 25 years with the Bureau of Reclamation, Mr. Meissner made many outstanding contributions to the development of equipment and procedure for testing cement, concrete, paint and other construction materials. He was a member of the American Concrete Institute, American Society of Civil Engineers, American Society for Testing Materials, and the Highway Research Board. He was active in committee work in these organizations and contributed numerous scientific papers on cement, and concrete research and control. He was awarded the Thomas Fitch Rowland award of the A.S.C.E. in 1947.

JOSEPH PENLASE, retired vice-president of the Michigan Limestone Division, U. S. Steel Corp., Rogers City, Mich., died July 29. He was 81 years old. Mr. Penlase joined the Calcite plant of the former Michigan Limestone and Chemical Co. in 1916 as master mechanic and was promoted to general superintendent in 1928. He became vice-president in 1939.

LESTER T. SUNDERLAND, chairman of the executive committee of the Ash Grove Lime and Portland Cement Co., Kansas City, Mo., died on August 3 at his home in Kansas City. He was 87 years of age and had been active in the firm until about four months ago. Mr. Sunderland long had been a leader in the cement industry. In 1921 and 1922 he served as president of the Portland Cement Association, Chicago, Ill., and since then had been a member of the board of directors and served on several committees. Born in Vinton, Iowa, Mr. Sunderland left school at the age of 14 to enter the coal business in Ottumwa, Iowa. He left there to complete his education at Pillsbury Academy, Owatonna, Minn. In 1887 he joined an older brother, James A. Sunderland, in the coal business in Omaha. Mr. Sunderland moved to Kansas City in 1909 to join the Ash Grove Lime and Portland Cement Co. as vice-president and general manager. In 1913 he was elected president and served in that position for 33 years before he was elected chairman of the executive committee. Two of his sons are officers in the company. Paul Sunderland is chairman of the board, and Allan B. Sunderland is president.

Lester T. Sunderland

PROF. GUSTAVE PAUL ROBERT MAGNEL, inventor of the Belgian system of prestressed concrete construction, died suddenly on July 5 at Ghent, Belgium, at the age of 65. He was a civil engineering graduate of the University of Ghent where he was appointed a professor in 1937. Among his awards was the Frank P. Brown Medal of the Franklin Institute of Philadelphia, Penn.

JAMES EDWARD JEFFERIES, president and founder of Jefferies & Sons, Ltd., Calgary, Alberta, Canada, passed away July 8. He was 67 years of age. Born and educated in Scotland, Mr. Jefferies moved to Canada in 1907 and founded the J. E. Jefferies Co. in 1915. In 1929 he installed a gravel crushing plant, later opened a sand pit and erected a concrete masonry and concrete pipe plant. In 1936 the name of the firm was changed to Jefferies & Sons, Ltd. Mr. Jefferies was a member of the American Concrete Pipe Association, Chicago, Ill.

J. DON ALEXANDER, president of the Alexander Film Co., Colorado Springs, Colo., died recently at the age of 70. Born in Webster Groves, Mo., Mr. Alexander later moved with his family to Keokuk, Iowa, where the idea for screen advertising originated. In 1919, he and his brother, Don M., organized the Alexander Film Co. in Spokane, Wash., moving to Denver and then in 1928 to Colorado Springs. Early in World War II the two brothers formed the AleXite division of the company to mine and process vermiculite products

J. Don Alexander

under the AleXite trademark. Later they entered the perlite field and began mining and processing perlite under the trade name PerAlex. Mr. Alexander was vice-president and a member of the board of directors of the Perlite Institute in 1953 when the AleXite division properties, including perlite mines, a mill and ore processing plant were sold to the Great Lakes Carbon Corp. Both of his sons, Don Alexander, Jr., and John H., are members of the firm.

M. KAMMERER, retired founder and president of the Kammerer Concrete Products Co., El Paso, Ill., passed away July 26 at the age of 88. Born in Weiler, Germany, Mr. Kammerer came to the United States at the age of 18 and founded the M. Kammerer Concrete Block Co. in 1903 in Fairbury, Ill., transferring the business to El Paso in 1917, at which time the name was changed to Kammerer Concrete Products Co. When his plant burned in 1937 he transferred to East Peoria, Ill. Mr. Kammerer was president of the company until 1945, when he retired and turned the management over to his sons.

HERBERT R. MERRICK, secretary-treasurer of the Hawkeye-Marquette Cement Co., Des Moines, Iowa, died suddenly on July 23. He was 61 years old. Born at Bevier, Mo., Mr. Merrick joined the auditing department of the former Hawkeye Portland Cement Co. in 1923 and became secretary-treasurer shortly after the company was purchased in 1940 by Marquette Cement Manufacturing Co., Chicago, Ill.

ARTHUR F. GOTTRON, treasurer of The Gottron Bros. Co., Fremont, Ohio, died July 7 after an illness of six months. He was 54 years of age.

FRED J. MILLER, senior partner in the Ready Mixed Concrete Co., Covington, Ky., died suddenly on July 23. He was 64 years old.

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NEW MULTI-PURPOSE MARFAK! *Texaco Marfak Heavy Duty Special* is the new, lithium-base, multi-purpose member of the famous Marfak family — especially designed for those who want *just one lubricant* to handle all chassis, wheel bearing, water pump and other bearing lubrication. *Texaco Marfak Heavy Duty Special* pumps easily even at winter temperatures and lubricates effectively regardless of the thermometer. It resists water washing and stands up in the severest service.

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INDUSTRY NEWS

Cover Picture

ON THIS MONTH'S COVER is an illustration of the T.V.A. Godwin phosphate plant at Columbia, Tenn., which was recently purchased by International Minerals & Chemical Corporation. It is planned to modernize the plant at a cost of $750,000 which will make possible the processing of 3000 tons of phosphate rock daily. The company will continue operations at full capacity at the Mt. Pleasant and Wales, Tenn., plants of this company. International Minerals & Chemical Corporation is one of the largest producers of phosphate in the country with extensive operations in Florida as well as Tennessee.

Survey's Fiftieth Anniversary

ILLINOIS STATE GEOLOGICAL SURVEY, Urbana, Ill., will hold its Fiftieth Anniversary celebration on October 11, 1955. Among the guest speakers will be Morris M. Leighton, Chief Emeritus of the Survey, J. R. Van Pelt, president of the Montana School of Mines and director of the Montana Bureau of Mines and Geology, and Norman J. Dunbeck, vice-president, International Minerals and Chemical Corp., Chicago. The affair will include a mineral industries luncheon and a 50th anniversary jubilee banquet.

In the forenoon of the following day there will be a tour of the Survey's laboratories, and in the afternoon the Illinois Survey will be host to the Association of American State Geologists.

Limestone Operations Consolidated

U. S. STEEL CORP., MICHIGAN LIMESTONE DIVISION, has consolidated its Annandale and Kaylor fluxing limestone plants in western Pennsylvania into a mining district. J. W. Baird, manager of the Annandale operation since 1950, will manage the new mining district.

Increases Cement Capacity

GIANT PORTLAND CEMENT CO. has announced an expansion program for its Harleyville, S. C. cement plant, increasing capacity by 30 percent from 1,800,000 bbl. to almost 3,000,000 bbl. annually. The company also acquired 600 acres of land adjoining the plant site.

Buys Kelley Island Properties

BASIC REFRACTORIES, INC., Cleveland, Ohio, has purchased the White Rock, Ohio, Gibsonburg, Ohio, and Buffalo, N. Y. plants of the Kelley Island Co. of Cleveland, together with related dolomite deposits, business, inventories, company name, patents and trademarks, according to an announcement by H. P. Eells, Jr., president of Basic Refractories, Inc. He stated that the purchase was made in order to extend the company's activities in dolomite products into the building industry.

The Kelley Island properties are being operated as a separate division of Basic Refractories, Inc., under the same management, consisting of F. J. Collins, president; J. W. Rockwood, vice-president; and E. J. Evans, secretary and treasurer.

Kiln To Be Added

MEDUSA PORTLAND CEMENT CO., Cleveland, Ohio, plans to boost the capacity of its York, Penn., plant by 750,000 bbl. with a new kiln costing $2 million. This is the second expansion program to be started at York within the past year. The earlier program, costing $4 million, involved an identical kiln installation (and other facilities), which will be in operation in a few months. The second kiln is expected to be operating in about a year. Recently the firm announced an $8 million expansion program for its Dixon, Ill., plant.

In the 12 months ended June 30, Medusa reported sales of $27,343,827 compared with $24,274,211 in the preceding 12 months. Net profit was $3,605,019 or $6.52 per share against $2,324, 071 or $4.20 per share.

Solite Plant Expanded

CAROLINA SOLITE CORP., a subsidiary of Southern Lightweight Aggregate Corp., has expanded its plant near Aquadale, N. C., at a cost of $400,000. Included in the expansion program were a third kiln, a 2½-cu. yd. shovel, three 15-cu. yd. Euclid trucks, and two 10-cu. yd. Euclid trucks. The plant has increased production to more than 100 rail carloads of finished Solite per week. R. F. Gibson is general superintendent of the plant and J. D. Elesen is assistant superintendent. The company also has a sales office in Charlotte, N. C.

New rotary kiln (left) just installed at the Aquadale, N. C. plant of the Carolina Solite Corp. Plant expansion cost $400,000

Elected President

KENT DIEHL, SR., of Houston, assistant to the president of Kennedy-Van Saun Manufacturing and Engineering Co., New York, has been elected president of the new Texas Portland Cement Co. plant at Echo, near Orange, Texas. Mr. Diehl will engineer and supervise the building of this $3 million, 1,500-bbl. per day plant.

Mr. Diehl, a former president and general manager of Gulf Portland Cement Corp., Houston, has served as special engineer for several American companies. He has also supervised and engineered portland cement plants in Mozambique, Italy, Southern France, Formosa and Indonesia, and has served as a consultant on cement manufacture and cement plant building and operation for 11 foreign governments. A graduate of Detroit University, Mr. Diehl has over 37 years experience in the cement business.

The new cement plant, which will occupy a 36-acre tract on a Southern Pacific R.R. siding at Echo off Highway 87, north of Orange, will utilize sea shell as a basic raw material. A 1200-ft. channel off the Sabine River will be constructed for the firm's six shell barges. A contract has been let to Kennedy-Van Saun for the purchase of $1,300,000 worth of machinery. The plant, which will require the services of about 65 workers, technicians and engineers, is expected to gross $2,300,000 annually.

Buys Sand Washing Plant

A SAND WASHING PLANT built by Owens Bros. Concrete, Inc., New Smyrna Beach, Fla., has been purchased by Ed Dalton White, operating as White Sands and Materials Co. Mr. White, an engineering graduate of the Georgia Institute of Technology, is well known in the engineering and construction field in the southeast. For eight years he was manager and industrial editor of the Southeastern Bureau of the McGraw-Hill Publishing Co., with headquarters in Atlanta.

According to Mr. White the sand washing plant has been redesigned to eliminate all silt and fines as well as all organic material. The sand, which Mr. White describes as a sharp white concrete and plaster sand, is hauled from a ridge six miles from New Smyrna Beach. Three 10-cu. yd. International trucks are used. The sand plant has a 30 cu. yd. per hr. capacity.

In addition to the sand processing operations, the company mines coquina for construction of driveways and roads. The company operates a ¾-cu. yd. Bantam dragline, one HD-9 and one HD-5 Allis-Chalmers and one D 7 Caterpillar bulldozer in addition to other equipment for mining and construction activities.

Plans are now in the making for moving the plant to another location in New Smyrna Beach and new facilities will be constructed.

Owens Bros. operate a ready-mixed concrete plant with four 3-cu. yd. Rex mixer trucks.

National Gypsum Expanding

NATIONAL GYPSUM CO., Buffalo, N. Y., has earmarked another $20 million for its expansion program, increasing the five-year total for the plan to $95 million. The additional appropriation will be spent for machinery, additions to existing warehouses, new warehouses and labor-saving devices in virtually all of the company's plants.

The company also plans to build six more plants within the next two or three years under the original $75,000,000 plant-expansion program. It includes gypsum plants in Toronto and Montreal, an asbestos mine and plant in Quebec, two gypsum plants in California and a new hardboard plant in Mobile, Ala.

New facilities will include a new 250,000-sq. ft. warehouse at an undisclosed Western plant on which the company plans to exercise a land option shortly.

Nearly $250,000 is being spent to increase production of the Gibsonburg, Ohio, industrial lime plant. Another $100,000 is going to the Medicine Lodge, Kan., plant to increase plaster output by one-third and step up gypsum wallboard production.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 27,066,000 bbl. of finished cement in May, 1955, as reported by the Bureau of Mines. This was an increase of 16 percent over the May, 1954, figure. Mill shipments totaled 29,172,000 bbl., 17 percent more than in May, 1954, while stocks were 7 percent less than on the same date a year ago. Clinker production during May, 1955, totaled 25,816,000 bbl., an increase of 17 percent over the May, 1954, figure. The output of finished cement during May, 1955, came from 157 plants in 37 states and Puerto Rico. During the same period of 1954, 23,279,000 bbl. of finished cement were produced.

Powerama Show in Chicago

GENERAL MOTORS CORP., Detroit, Mich., will hold a 26-day Powerama show in Chicago beginning August 31, marking the firm's overall production of its 100 million diesel horsepower. The theme of the show will be "Power for the Wheels of Progress." One feature will be a roadbuilding exhibit arranged by the firm's Detroit Diesel Engine Division, which will show a section of highway in various stages of construction. Practically every type of road building machinery and equipment will be displayed. In addition, the Division will exhibit a rock crushing plant, cotton gin, sawmill, and oil well drilling rig in actual operation. Other G. M. divisions will exhibit a new lightweight diesel tractor, the world's largest dump truck, and a submarine. The show will be staged on a 23-acre site fronting Lake Michigan.

New Office Building

INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago, Ill., will build a new quarter-million dollar air-conditioned office building at its potash mine and refinery near Carlsbad, N. M., A. Norman Into, vice-president in charge of the corporation's Potash Division, announced recently. Work will start immediately. The building is expected to be ready for occupancy about March, 1956.

The new structure will contain over 12,000 sq. ft. of office space and will make it possible for all staff officers at International's Carlsbad operations to have their offices in one building. Office facilities will be provided for approximately 75 people.

South Africa Lime Plant

NORTHERN LIME CO. has opened a modern rotary kiln lime plant at Silver Stream, South Africa, about 100 miles west of Kimberly. Plans call for installation of two additional rotary kilns at an estimated cost of 2,700,000 pounds Sterling, which will make the plant one of the world's largest. Part of the output will be used in a uranium-extraction process.

Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of July were listed by the Portland Cement Association as follows:

	Sq. yd. awarded during July, 1955
Roads	2,236,998
Streets and alleys	2,606,248
Airports	943,828
Total	5,787,074

Cement Plant Expansion

BRITISH COLUMBIA CEMENT CO., subsidiary of the Associated Portland Cement Manufacturers, London, England, has announced plans for a two-and-a-half year expansion program at its Vancouver Island works involving expenditure up to $4 million. Capacity will be increased from 2.2 million to 3.2 million bbl. annually.

Company officials said the present market in British Columbia can absorb about 1.8 million bbl. a year and is

expected to grow fast enough to take up the extra capacity when it is completed. About $1 million will be spent.

The company also plans to build a new plant in addition to present facilities if the market demand is sufficient when current additions are completed.

Cement Plant Proposed

NATIONAL CEMENT CO. has petitioned the San Bernardino County Planning Commission to rezone a plot of land near Ivanpah, Calif., from light to heavy manufacturing and to approve the company's plans for building a $6,500,000 cement plant at this site. If approved, the plant and quarries will be built on a 6½-sq. mi. area on the north slope of the New York Mountains one mile north of Ivanpah. The plant would be served by a spur of the Union Pacific railroad.

Barite Property Leased

A GROUP OF INVESTORS, headed by R. Jamison Williams, Detroit, Mich., has leased several sections of barite-rich land near Dierks, Ark., from Dierks Forests, Inc., with the stipulation that the investors erect a $300,000 mine and plant, with construction to start before the end of 1955. The contract permits Dierks Forests to continue logging operations in the area.

Standard Lime Acquisition

STANDARD LIME & CEMENT CO., a subsidiary of American Marietta Co., Chicago, Ill., has purchased the brine wells of Michigan Chemical Corp. at Manistee, Mich. Standard Lime plans to use the brine as a source of magnesium chloride.

To Sink 3000-ft. Shaft

POTASH COMPANY OF AMERICA, Carlsbad, N. M., plans this fall to sink a 16-ft. shaft, 3000 ft. below the surface at its Patience Lake holdings, 14 mi. east of Saskatoon, Saskatchewan. The excavation will take more than a year to complete.

Gravel Plant Remodeled

FORT WORTH SAND AND GRAVEL CO., Fort Worth, Texas, has spent $175,000 remodeling its Quigley plant at Hurst, Texas. The new plant has a capacity of 200 tons of washed sand and gravel per hour, and is equipped to produce a complete line of aggregates.

Cement Company Expands

OREGON PORTLAND CEMENT CO., Portland, Ore., is expanding its cement plant at Oswego, Ore., at a cost of more than $3,000,000. The plant capacity is being increased by about 50 percent, or approximately 700,000 bbl. of cement annually. Plans call for a 287-ft. kiln, new dust collectors for the present kilns, and a complete new dust collection system for the additional kiln.

The company also plans to expand its cement distribution center in Albina, Ore., at an approximate cost of $50,000. This will include a warehouse and facilities for handling sacked cement as well as bulk cement, currently being handled.

Included in this program is the installation of stone unloading facilities, additional conveying, crushing and screening equipment, raw grinding mills, slurry storage, finish grinding mill and additional storage for 50,000 bbl. of finished cement at Oswego.

The quarry in Polk County, Ore., will be re-equipped with a shovel, trucks, conveyors, bins, etc., amounting to about $250,000.

The expansion program is expected to be completed early in 1956. Frank E. McCaslin is president of the company.

Coming Conventions

September 19-24, 1955—
National Industrial Sand Association, Fall Meeting, The Greenbrier, White Sulphur Springs, W. Va.

October 10-13, 1955—
American Mining Congress, Annual Convention, Las Vegas, Nev.

October 17-21, 1955—
National Safety Council, 43rd Congress and Exposition, Conrad Hilton, Congress, Morrison and La Salle Hotels, Chicago, Ill.

October 19-21, 1955—
National Lime Association, Combined Annual Convention and Operating Meeting, Del Monte Lodge, Pebble Beach, Calif.

October 20-21, 1955—
Empire State Sand, Gravel and Ready Mix Association, Fall Meeting, Hotel U. S. Thayer, West Point, N. Y.

Oct. 31-Nov. 1, 1955—
American Concrete Institute, Southeast Regional Meeting, Atlanta Biltmore Hotel, Atlanta, Ga.

November 1-3, 1955—
Southeastern Concrete Pipe Association, 8th Annual Convention, Key Biscayne Hotel, Miami Beach, Fla.

November 14-16, 1955—
American Concrete Pipe Association, Fifth Annual Short Course School of Instruction, Chase Hotel, St. Louis, Mo.

January 23-25, 1956—
National Concrete Masonry Association, 36th Annual Convention, Roosevelt Hotel, New Orleans, La.

February 13-16, 1956—
National Sand and Gravel Association, 40th Annual Convention and Biennial Show, Conrad Hilton Hotel and Chicago Coliseum, Chicago, Ill.

February 13-16, 1956—
National Ready Mixed Concrete Association, 26th Annual Convention and Biennial Show, Conrad Hilton Hotel and Chicago Coliseum, Chicago, Ill.

February 15-17, 1955—
National Agricultural Limestone Institute, Blackstone Hotel, Chicago, Ill.

February 20-22, 1956—
National Crushed Stone Association, 39th Annual Convention and Exposition, Conrad Hilton Hotel, Chicago, Ill.

HINTS AND HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Sweeping Large Floor Areas

WHERE A LARGE WAREHOUSE FLOOR has to be kept clean, the use of brooms operated by hand can be an important

Power-operated sweeper keeps large floor area of gypsum wallboard plant in a clean condition

labor cost, especially if neatness and appearance are essential. A western wallboard and gypsum lath plant uses a Wilshire power sweeper very effectively for this purpose. One of the buildings cleaned with this sweeper is about 800 ft. long and several hundred feet wide.

Rod Mill Feeder

ORIGINALLY, ROD MILLS were used to reduce crusher run material in the 1½ to ⅜-in. range to minus ¼-in. The rod mill was essentially a preliminator crusher preceding ball mills that

Chutes, indicated by arrows, draw from bins so any desired size or blend can be sent to the rod mill

did the fine grinding. In the manufacture of sand, it has often been used to reduce material in the minus ¼-in. range to obtain more fines. Ball mills might have been the better grinding unit for this latter type of work. However, the rod mill can take most any type of coarse feed (those unwanted sizes) and reduce it to sand.

In the illustration, the arrows indicate how one producer fed a 7- x 10-ft. Allis-Chalmers rod mill. The chutes fed a flat running belt conveyor so that a blend of several sizes could be made or one size could be fed to this belt. The material then dropped to the lower inclined belt conveyor, the tail pulley of which shows in the illustration. This belt conveyor elevated the material to a hoppered bin over the rod mill.

Two Conveyors Serve One Bin

AT A WESTERN SAND AND GRAVEL PLANT, one of the truck load-out bins is served by two parallel belt con-

One steel gallery supports two parallel belt conveyors supplying a single partitioned bin

veyor assemblies which is shown in the illustration. One steel gallery supports both conveyors, and a partition in the steel bin keeps the two aggregates separated.

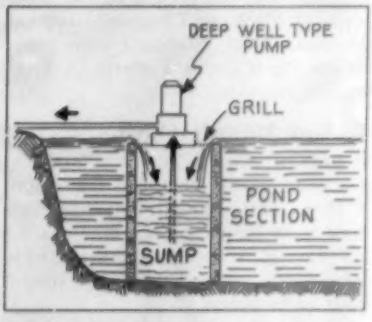
Sump Recovers Clear Water

A PRODUCER IN THE SOUTHWEST where water is relatively scarce runs the tailings from the sand and gravel plant into a pond that is about 200 ft. long and 80 ft. wide. Material flows

Sump to recover clear water is equipped with an 8-in. pump

in one end, and near the opposite end is an 8-in. Johnson deep well pump that is supported above a concrete sump which is separate from the main pond.

Only clear water from the top of the settling pond overflows into the sump. The water is reused at the primary screens. Settled material is bailed out of the pond from time to time. About 400 to 500 tons an hour are washed. Some of the extremely fine

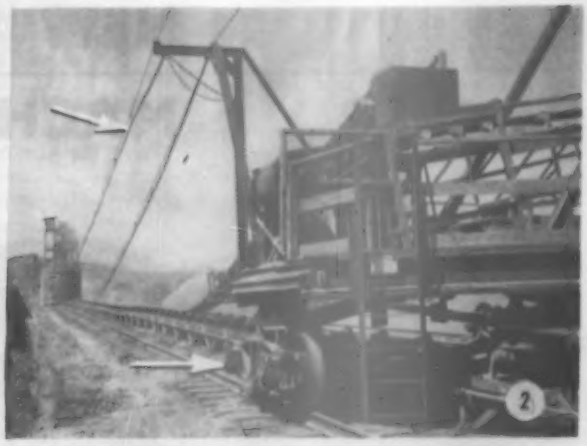


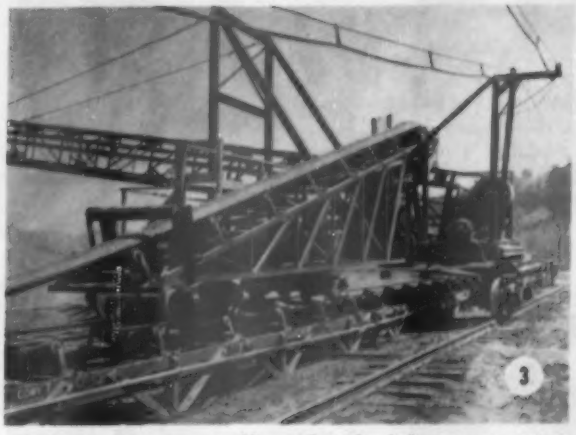
Cross-section of pond and sump. Only clear water (A) overflows at top into sump

material that would normally go to the pond is removed in the plant by a liquid cyclone. This type of unit reduces the load to the pond and recovers a saleable product.

Remote Controlled Stacker

A STACKER BELT CONVEYOR assembly for ground storage of aggregates which is controlled by an operator at the plant from a remote control panel is shown in the four illustrations. Fig. 1 shows the main support for the stacker. Fig. 2 is the outboard and third supporting track with the upper





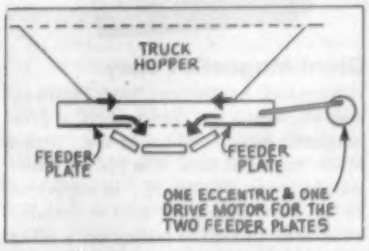
Views of stacker belt conveyor system remote-controlled by operator in the plant

arrow pointing to the electric cable power line supplying energy to the assembly. Fig. 3 shows the frame that supports the inclined belt conveyor to the main frame and the roller above the belt conveyor that functions when the belt is started up. Fig. 4 is the Pacific Western gear drive for the main carrier belt. This stacker belt conveyor system will handle up to 400 t.p.h.

Double Reciprocating Feeder

SHOWN IN THE ILLUSTRATION is a truck unloading crushed limestone (minus 1-in.) to a hopper under which is a novel reciprocating feeder that makes it possible to unload the relatively long hopper with one drive motor and one eccentric. The sketch shows some of the reciprocating feeder details.

The two feeder plates, one on each side of the belt conveyor, are connected together by the steel sideboards of the feeder. As the plate reciprocates, it draws stone alternately from one side of the bin to the other. The truck hauls 20 to 21 tons per load, using a steel enclosed body similar to a bulk cement truck. Two unloading gates are cab-controlled. The body on the Kenworth truck was made by Clough Equipment Co.



Details of double reciprocating feeder

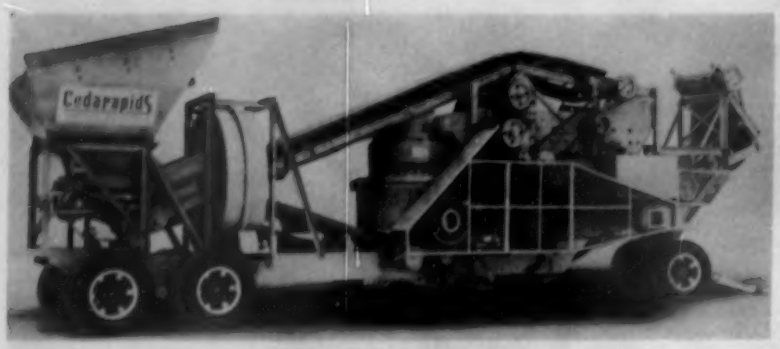
Specially designed tractor - semi - trailer unit with steel body unloading crushed limestone to reciprocating feeder

Sand Drainage

IN A NEW and relatively small sand and gravel operation near the Pacific Coast, a sand drainage system has been installed which is similar to the larger plants supplying sand for U. S. Corp of Engineers. The outboard end of the stacker conveyor for the sand can be swung laterally by a hand winch mounted near the ground level. The device not only permits much larger storage capacity, but it permits ample drainage of water in the sand stockpile.

Stacker belt conveyor can be moved laterally by means of a winch

NEW MACHINERY



Portable Secondary Crusher

IOWA MANUFACTURING CO., Cedar Rapids, Iowa, has brought out the Cedarapids Model 30-C portable secondary crushing and screening plant, in which the crushing is performed by a 30-in. Symons R cone crusher built by Nordberg Manufacturing Co., Milwaukee, Wis.

It is specially designed for use in quarries or gravel pits where the material is exceptionally hard. The material is fed to the plant hopper equipped with a 30-in. reciprocating feeder, which discharges onto a 30-in. wide feed conveyor, and then to a 4- x 10-ft. two-and-a-half deck horizontal vibrating screen. Material retained on the top deck goes through the Symons cone crusher, and is recirculated back to the screen for final sizing.

Five different screen deck arrangements are available for producing up to three finished product sizes. The screen is also available with a sand screw discharging onto a side delivery conveyor. The screen can be equipped with spray bars for producing washed aggregate. The plant may be driven by a 150-175-hp. gasoline or diesel engine or electric motor.

Metal Backed Rubber Chute Lining

GOODYEAR TIRE AND RUBBER CO., Akron 16, Ohio, has introduced a metal-backed rubber chute lining which can be used as a basic construction material, and can be installed on existing or new structures. Designated "Armaplate," the lining consists of abrasive resistant rubber bonded to hot-rolled steel. It can be formed, sawed, sheared, rolled, bent and punched like sheet steel, and it can also be bolted or tack welded. The steel-bonded-to-rubber technique eliminates the possibility of foreign matter lodging between the metal and rubber bond. The lining is available in four sheet sizes: 48 x 180 in., 48 x 144 in., 36 x 180 in., and 36 x 120 in. These are available in four overall gauges: ¼ in., ½ in., ¾ in., and 1 in., including the $\frac{1}{16}$-in. steel plate.

Rubber Slurry Valves

EQUIPMENT ENGINEERS, INC., 41 Sutter St., San Francisco 4, Calif., has announced Krebs rubber slurry valves, which are encased and said to be rupture-proof and abrasion resistant, have center orifice flow, and remote finger-tip control. High pressure is permitted with cylinder grade castings on the valve's jacketed body. To avoid loss of hydraulic fluids at high pressures, the main body flanges are grooved and fitted with rubber "O" rings. Remote control is applied by compact, adjustable hydraulic control units.

Variable Speed A.C. Motor

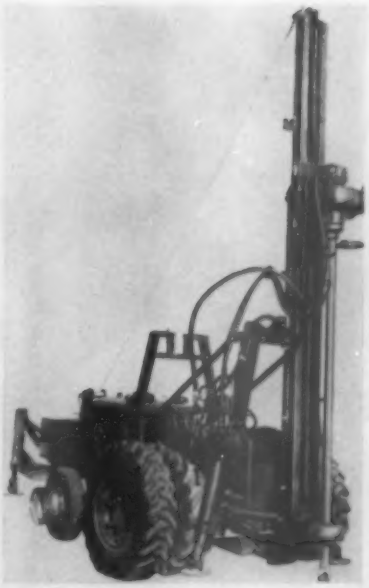
BOGUE ELECTRIC MANUFACTURING CO., 52 Iowa Ave., Paterson, N. J., has announced the N-S variable speed a.c. motor, which utilizes electric controls rather than mechanical drives. It can be equipped with controls ranging from completely automatic through semi-automatic to manually operated controls. The motor can provide from 0.5 to 1000 hp. with a speed ranging from 30:1 to 1.5:1, and it operates on three phase a.c. power of 50, 60 or 400 cycles. It is also adapted to high starting torque loads, making it suitable for a wide range of applications.

Overhung Engine Scraper

EUCLID DIVISION, GENERAL MOTORS CORP., Cleveland 17, Ohio, has brought out two overhung engine type scrapers, each having a struck capacity of 18 cu. yd. The scrapers utilize an Allison Torqmatic drive consisting of torque converters and semi-automatic transmission. Model S-18 is powered by a 300-hp. engine, and has 27.00 x 33 tires. The Twin-Power Model TS-18 scraper has two 194-hp. engines, one driving the tractor wheels and the other providing power to the rear wheels. Ninety degree steering permits the scraper to make 180 deg. turns in 35 ft. or less. Bowl lift, apron and ejector operations are independently controlled by hydraulic lever action.

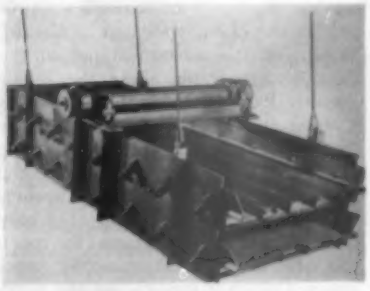
Giant Magnetic Pulley

STEARNS MAGNETIC, INC., Milwaukee 46, Wis., has announced a giant magnetic pulley, 60 in. in dia., with a 60-in. magnetic face. The pulley, which weighs over 24,000 lb., is supported by an 8-in. dia. shaft and is installed as a head and drive pulley on a 60-in. wide conveyor.



Portable Drilling Rig

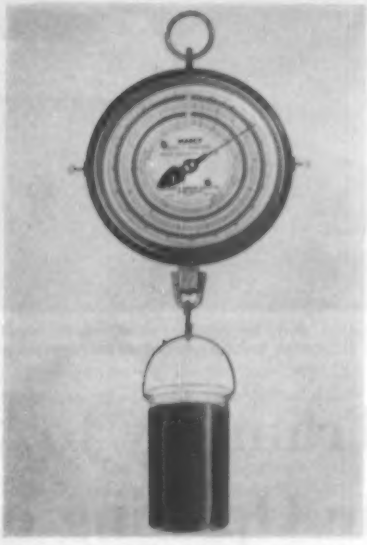
SCHRAMM, INC., 900 E. Virginia Ave., West Chester, Penn., has developed a portable drilling rig, consisting of the Rotadrill mounted on a Pneumatractor. The unit drills a 4¼-in. hole to a depth of 500 ft., and one man operation is permitted, since the controls are arranged in one bank, adjacent to the mast. Special weight boxes and dual rear-wheels on the 125 c.f.m. Pneumatractor provide 10,000-lb. down pressure. Compressed air drilling pressures of 20-30 p.s.i. may be increased for dewatering or breaking out blockages. The heavy welded structural steel mast is lowered for traveling between jobs, and can be operated at various angles for sloping holes.



Vibrating Screen

ALLIS-CHALMERS MANUFACTURING CO., 975 S. 70th St., Milwaukee, Wis., has brought out an "Aero-Vibe" screen, Model AVS, which utilizes a simplified two-bearing design with counterweight wheels and bolted construction. It is designed to handle a variety of materials such as sand, gravel, crushed stone, fertilizers, oyster shells, gypsum, lime, chemicals, etc. It can also be used in separating solid foreign particles from liquid and solutions, and for thickening, dewatering and stream pollution reduction.

The screen body is constructed of rolled steel with heavy channel cross members and rigid diagonal braces. The longitudinal members are replaceable with lock nuts used throughout for ease of replacement. The screen is available in suspended or floor mounted models, frame mounted for portability, semi or totally enclosed, with one, two or three decks in sizes 3 x 5 ft. to 4 x 10 ft.



Pulp Density Scales

THE MINE AND SMELTER SUPPLY CO., 1438 Seventeenth St., Denver, Colo., has introduced the Marcy pulp density scale which provides direct reading of: weight of sample in grams or kilograms; specific gravity of liquid; specific gravity of pulp; percent solids contained in a pulp of any specific gravity; and specific gravity of dry solids. The scale is 10 in. in dia., but is said to be equivalent to a 47-in. beam balance in accuracy. The filled plastic container is hung on the scale hook, and the reading is taken direct from the dial without reference to separate charts or tables. The cylindrical plastic container is said to be inert to the action of alkalis and acids, and is made in four different colors to permit identification of different samples. The scale is applicable over any range of solids, light or heavy density.

Aluminum Roof Coating

THE MONROE CO., INC., 10703 Quebec Ave., Cleveland 6, Ohio, has brought out an aluminum coating, siliconed Asbestolite, which is said to protect and preserve roofs while reducing under-roof temperatures as much as 20 deg. Features claimed for the coating include qualities of withstanding extremes of heat and cold and high resistance to chemical vapors, gases and fumes. It is also said not to be affected by roof expansion and contraction and not to crack or blister.

Self Vulcanizing Belt Repair

FLEXIBLE STEEL LACING CO., 4607 Lexington St., Chicago 44, Ill., has introduced Rema self-vulcanizing rubber repair material for repairing bruises, tears and edge damage on conveyor belts without the use of heat or vulcanizing equipment. The material is said to seal out moisture, and reduce mildew, rot and deterioration. The product can also be used to cover metal belt fasteners used to join conveyor belts.

Speed Reducers

FOOTE BROS. GEAR AND MACHINE CORP., 4545 S. Western Blvd., Chicago, Ill., has announced "Line-O-Power" speed reducers with capacities ranging from fractional hp. to 150 hp. "DutiRated" lifetime gears are utilized to provide higher capacities in a compact unit. The input and output shafts are in a direct line, to permit coupling of motor and speed reducer in less space. A "Spline Drive" pinion provides ease in changing reduction ratios. The range of nominal ratios for double, triple and quadruple reductions is from 5.06 to 1478.

View of crushing plant showing a quarry haulage unit, to the left, dumping to hopper feeding primary crusher. To the right, may be seen bucket elevator behind secondary crushing plant which carries material to stacker belt conveyor

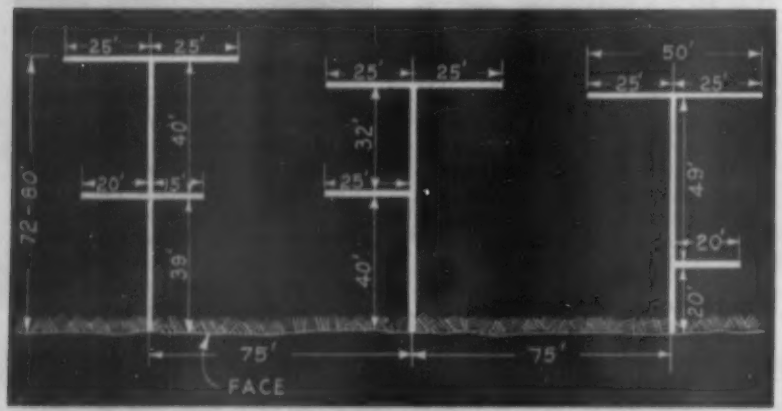
From Aerial Tramway to Truck-Rail Haul With the Opening of New Quarry

• Northwestern Portland Cement Co. replaces depleted deposit with new quarry and crushing plant 58 miles from plant. Diesels supply all power requirements

By WALTER B. LENHART

When the Northwestern Portland Cement Co., limestone quarries adjacent to the plant became depleted, from an economic standpoint, the company placed a new crushing plant and quarry in operation at Soda Springs, Wash., late in 1954.

This new location introduced a problem as the plant is located at Grotto, Wash., on the western slopes of the Cascade mountains along the scenic Stevens Pass Highway that connects Everest and Wenatchee, but the new quarry is on the eastern slopes of the Cascades, about 10 miles above the head of Lake Wenatchee. Soda Springs is not on any highway maps, but only on Forestry Service maps. To reach the new deposit, the company spent about $100,000 resurfacing the highway for the last few miles to the quarry. The old quarry at Grotto used two aerial tramways to transport stone to the plant.



Drilling and loading pattern for "coyote" blasting shot

The quarry at Soda Springs is somewhat unique as compared to other limestone quarries serving the cement industry in the State of Washington. There are five portland cement plants in the State, and until the Soda Springs operation started, at least four of the

Two views of tractor pulling special 21-ton capacity trailer which is used to haul crushed stone to carloading facilities at Merritt, Wash. In the view, to the left, may be seen the scale house in the background for 60-ft. scale

quarries used aerial tramways as a part of the stone delivery systems.

Both Truck and Rail Haul

Transportation of the high calcium limestone from Soda Springs to Grotto involves first a truck haul of 21 miles and a rail haul of about 37 miles over the Northern Pacific Railroad. The company uses a specially designed truck body that resembles a bulk cement truck carrier, consisting of a tubular tank or body with two bottom dump, hydraulically operated gates. The bodies are semi-trailer jobs using Kenworth tractors. Each truck hauls 21 tons and the trucks are weighed as they are loaded; under the loading bins is a 60-ft. Fairbanks, Morse truck scale. There are four trucks in service and the haul on the average is 1½ hr. for the round trip. The main design feature of the trucks is the low center of gravity. The truck bodies were made by the Clough Equipment Co., Seattle, Wash.

Quarry Operation

The quarry at Soda Springs is operated from a single bench about 75 ft. high at its highest point. Overburden is practically nil and consists of a small amount of brush and a few trees. Primary loading is done with a 3000-1½-cu. yd. Manitowoc, diesel-powered shovel. Two Model W-55 Koehring Dumptors haul from the face to the primary crusher over easy grades, a distance of about 500 ft. The Koehring units haul 7½ tons (5½-cu. yd.), and have been in service for 18 years. The haulage units have been modernized by installing hydraulic brakes.

The main primary blast to date was a coyote shot. Three tunnels, each 72 to 80 ft. long, were driven into the face with each tunnel being on about 75-ft. centers. At the end of each tunnel cross-cuts, parallel to the face of the quarry, were driven for 25 ft. In front of this cross cut, a second cross-cut with wings each 15 to 25 ft. long were driven. Tunnels were loaded with 19½ tons of du Pont Nitramon powder, total load, the blast yielding about 120,000 tons of stone. The limestone is white and somewhat marbleized and tends to shatter easily. Secondary drilling is done with hand-held air drills. Two 315 c.f.m. Ingersoll-Rand compressors are available. One is mounted on steel skids and the other on metal wheels. A D-6 Caterpillar tractor is provided for moving the compressors and other incidental quarry and road work. It uses a Hyster power unit for the blade.

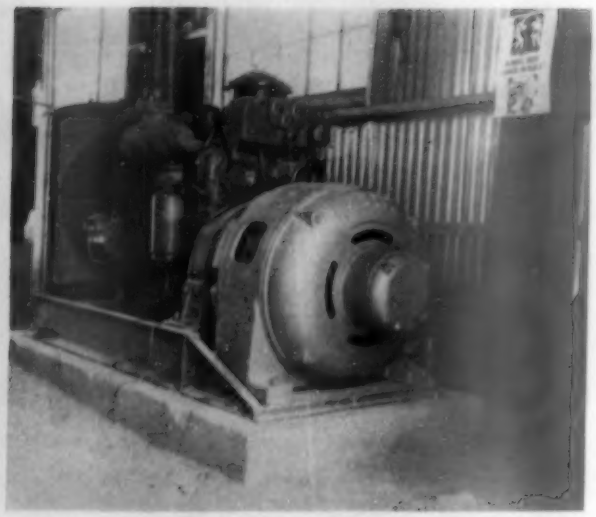
As the Cascade mountains in the Soda Springs area have a heavy snow fall, most of which comes in January and February, operations are conducted here about nine months of the year. A stockpile at Grotto is maintained of sufficient size to run the plant during the winter months. The company maintains a boarding house at the quarry for 20 men.

Primary crushing is done with a 30- x 42-in. Pioneer jaw crusher supplied by an apron feeder. The secondary and final crusher is a C-9 Pennsylvania hammermill powered with a 150-hp. motor. A 5- x 12-ft. Hewitt-Robins vibrating screen acts as a scalper ahead of the hammermill. A belt conveyor delivers to this screen and a second belt conveyor returns oversize to the No. 1 belt. Throughs from the screen are picked up by a bucket elevator that serves a stacker belt conveyor. The elevator is about 60 ft. high and uses 7- x 17-in. buckets. The 20-in. stacker belt rides 24-in. carrier rolls. This design was used so that in the future more capacity for the stacker could be secured by installing a wider belt. The plant has a capacity of 125 t.p.h. The stacker belt conveyor delivers to an outside storage pile that has a capacity of about 700 tons.

Under this pile is a tunnel reclaiming belt conveyor, fed by gravity type gates, that delivers to small steel holding bins over the truck loading scales. Trucks to be loaded pull under this bin and air-operated gates fill the truck in less than one minute. The stone has all been crushed to minus 1½-in. The Hewitt-Robins screen originally

A 1¾-cu. yd. shovel loading quarry haulage unit

Diesel which drives 400 kv.-a. generator supplying major power requirements of crushing plant



A 52.5 kv.-a. synchronous alternator driven by diesel engine supplies incidental power for lights, etc. at crushing plant

had three decks with a steel plate as the lower deck. Finished crushed stone on this plate was to slide into the boot of the bucket elevator, but dust, especially on damp days, caused stoppages so a short, flat running belt conveyor picks up the fines and delivers to the bucket elevator.

Electric power for the operation is provided by an 8-cylinder General Motors diesel (Model 8-268-A) that drives a 400 kv.a. Westinghouse generator. A second General Motors diesel drives a 52.5 kv.a. Palmer Electric Mfg. Co. synchronous alternator for lights and incidental power. A small compressor, driven by a Wisconsin air cooled gas engine, is available for start-up purposes.

Haulage trucks deliver to the car loading facilities near Merritt, Wash., by means of a ramp and dump to a steel dual hopper. Under the dual hopper is a dual reciprocating plate feeder which delivers to a belt conveyor that unloads to the open hopper cars of the Great Northern Railroad. By means of the dual plate feeder both bins are emptied, using one motor and one eccentric for the dual feeder. Empty cars are spotted under the loading apron by gravity, although a car puller powered with an industrial Ford gas engine is available. All other electric power is purchased. It requires about 9 min. to load the 21-ton payload of a truck to railroad cars.

Before installing the equipment at Soda Springs, the Northwestern Portland Cement Co. carried out an extensive core drilling program. These core drilling test results indicated enough rock at the new quarry to run the Grotto plant for 50 years. This work and the general quarry layout was under the direction of Carl N. Anderson, mining engineer, Portland, Ore.

The Grotto plant of the Northwestern Portland Cement Co. has an annual capacity of 600,000 bbl. of portland cement. Equipment includes an 11-ft. 3-in. by 240-ft. Traylor kiln, a 7- x 40-ft., three-compartment mill on the raw side, and a similar size mill on the finish. Both mills are Traylor units. The plant operates wet and produces standard, masonry, high-early, and low-alkali cements.

Goodfellow Bros. of Wenatchee, Wash., as well as company staff, were responsible for the road and plant construction at Soda Springs. The total investment is in the $350,000 range. Some of the equipment used at Soda Springs saw service at the Grotto quarries.

James Halloran is quarry superintendent at Soda Springs. Frank Baldwin is superintendent at Grotto.

Northwestern Portland Cement Co.'s plant at Grotto shipped its first cement in 1928. The company was organized

(Continued on page 47)

This stockpile contains 7000 tons of minus 1-in. material with a reclaiming tunnel belt conveyor below. The belt conveyor, to the right, fills holding hoppers over truck scales

Impact type crusher driven by 150-hp. electric motor

Dredge has 10-in. pump driven by butane-fueled engine

HYDRAULIC DREDGING
In California for Sand and Gravel

ONE OF THE FIRST fully engineered suction dredges to be used west of Denver for commercial sand and gravel went into operation recently on the San Joaquin river, near Fresno, Calif. The dredge is owned and operated by Merl E. Richard. There are many dredges in the West working gravel deposits for the gold content. Some of these are the world's largest ladder type dredges. However, none produce gravel for commercial purposes mainly because they operate in thinly populated areas. The paucity of dredges in the aggregate field in the West stems mainly from two facts; no water, and much of the gravel is very often large in size.

Near Denver, Colo., is a "Doodle-Bug" dredge operation with a second soon to go into operation. The term, "Doodle-Bug," in the mining industry refers to a dredge with the processing equipment floating on suitable pontoons with a dragline working at the shore line, delivering gravel to a hopper on the dredge.

The Fresno installation is a fully engineered job using a 10-in. Krogh gravel pump powered by a 250-hp. Hudson Invader engine operated with butane fuel. This power unit replaced a 110-hp. engine, also operated with butane. The larger motor has boosted production to around 150 t.p.h. The pump uses an enclosed runner with carbon steel liners. At the time of inspection, the pump had handled about 25,000 tons with no sign of wear to the liners.

The assembly is mounted on eight steel pontoons, four to a side, each 5- x 7- x 5-ft. with a 500-gal. butane tank mounted in the water between the pontoons. Mounting the tank in this manner keeps the butane above freezing temperatures at all times. This is said to aid in better combustion.

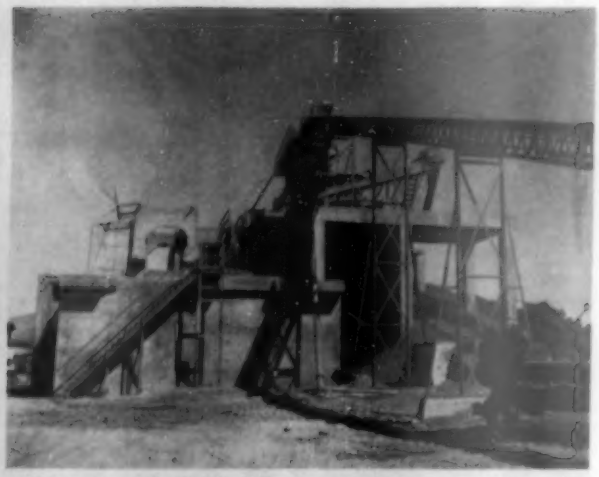
Merl E. Richard

The pump will dig to a depth of 50 ft. below water. Gravel in the deposit is mostly minus 4-in. but an occasional 6 to 8-in. piece has been encountered with several passing through the pump without difficulty. The deposit being worked is on the flanks of the San Joaquin river and water levels are from 4 to 6 ft. below the surface. About 4 to 5c of free gold per cu. yd. is recovered.

The power unit on the dredge drives a small centrifugal pump that supplies water to two jet pipes that parallel the suction line and also supplies water to the pump's bearings. High pressure water can be jetted into the discharge for priming purposes. A vacuum gage is mounted on the suction line. If a cave-in, or other stoppage of the suction line occurs, the inches of vacuum will increase rapidly so the operator can take protective steps. On the discharge line there is also a pressure gauge so that by watching both gauges the operator can keep the pump working at high efficiency.

Mr. Richard has formed a partnership under the name of R. & M. Rock and Sand Co., which will operate a processing plant farther upstream on the banks of the San Joaquin River. The land will be controlled by R. & M. Rock and Sand Co.

Bituminous mix plant uses major part of aggregate production. Aggregates are also sold to a nearby ready mix plant



Screen, above, for finished sizes is a two-deck, 4- x 12-ft. screen with sand screw to the right

Build NEW GRAVEL PLANT On Site of Famous Shasta Operation

• Redding Sand & Gravel Co., Redding, Calif., operates a "packaged" plant with three types of crushers and sand recovery equipment. Supplies bituminous and ready mix plants

By WALTER B. LENHART

WHEN THE REDDING SAND & GRAVEL Co. built its new plant this year at the foot of Butte street on the banks of the Sacramento River near Redding, Calif., it turned back the pages of history. The newer operation is on the old site of the Six Companies, Inc., gravel plant, headed by the Henry J. Kaiser Co., builder of the Shasta Dam, the world's second largest. The older operation of the Kaiser interests became more or less famous for the 10-mile long belt conveyor system which delivered washed and sized aggregates to the damsite near Kennett, Calif. The dam was built in the late 30's, and some remnants of the older plant were still usable by the Redding Sand & Gravel Co., notably one of the concrete structures and some reclaiming tunnel units.

Redding, Calif., is at what might be called the northern end of the Sacramento Valley. South of the city is a rich agricultural area, and immediately to the north the terrain becomes mountainous and is an important copper, lead, zinc, gold and silver mining district.

The sand and gravel plant has a capacity of 150 t.p.h. and produces 1½- to ¾-in.; ¾-in. to ¼-in., and minus ¼-in. sand. All material going to the Madsen bituminous mix plant is 100 percent crushed, and is processed dry. Two stacker belt conveyors finger out over the reclaiming tunnel and handle the material for the paving section. Crushed gravel is not normally used for concrete work.

With a few exceptions, equipment is essentially a Universal "Packaged" plant. Three 4- x 12-ft. vibrating screens are used, two being double-deck, and one three-deck. The three-deck screen operates dry with oversize crushed in a 16- x 30-in. Universal roll crusher and a 2-ft. Ty Traylor gyratory crusher with throughs returned to the main belt conveyor from the primary crusher.

Material for processing is pushed by a D-8 Caterpillar tractor and dozer to a dirt ramp serving the primary hopper. A reciprocating feeder delivers into the No. 1 belt conveyor

Roll crusher and gyratory receive feed from 4- x 12-ft., three-deck, vibrating screen

Vern M. Dwyer, plant manager

Scalping screen precedes primary jaw crusher; bulldozer pushes material to hopper

serving the scalper screen ahead of the 20- x 36-in. Universal jaw crusher. This 36-in. belt conveyor has sideboards for its entire length. A stationary magnet is installed over Belt conveyor No. 2 following the primary jaw crusher. The scalper screen can take out a minus 1½-in. material and ground store it for pit-run, road stone, or the material can go to the screen and Eagle sand screw mounted on top of one of the concrete supporting structures. The sand screw is a 24-in. by 22-ft. twin Eagle.

Reclaiming Tunnel

Under the wet section of the plant is a reclaiming tunnel with a belt conveyor. This belt conveyor transfers to a long inclined belt conveyor that serves a Noble ready-mixed concrete batching plant alongside the gravel plant. However, it is operated by another company. The tunnel belt conveyor can also deliver material to a shorter inclined belt conveyor for truck loading. The flow diagram gives the essentials of the new plant.

For loading in the pit, the company has a ¾-cu. yd. Northwest shovel with International and Chevrolet trucks available for haulage. Additional reclaiming can be done with a Hough Payloader. At the office near the plant, the company has Murphy scales with a 60-ft. long scale platform so that trucks plus trailers can be weighed at one setting.

Some time ago, gold dredges operated in the Sacramento river close to Redding, and it was reported that the old Henry J. Kaiser plant recovered considerable of the precious metal from their operations. Later, the Redding Sand & Gravel Co. may install modest equipment to do likewise.

The Redding Sand & Gravel Co. is owned by Tisdale & Brown, well-known contractors in the area. Vern M. Dwyer is plant manager.

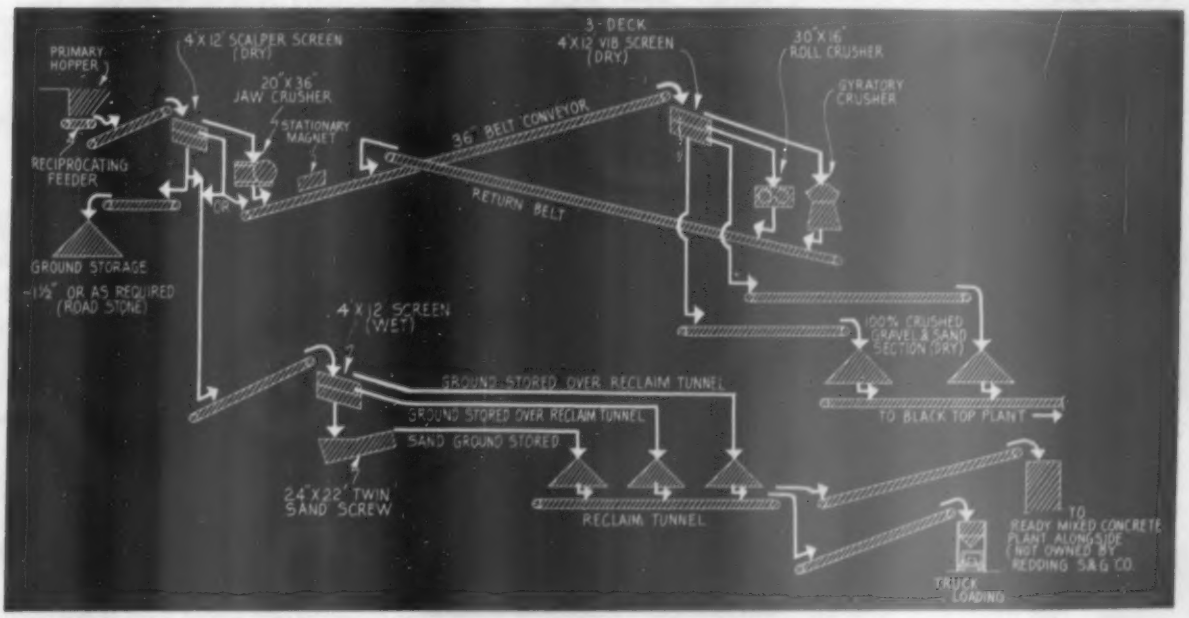
New Cement Plant Quarry

(Continued from page 44)

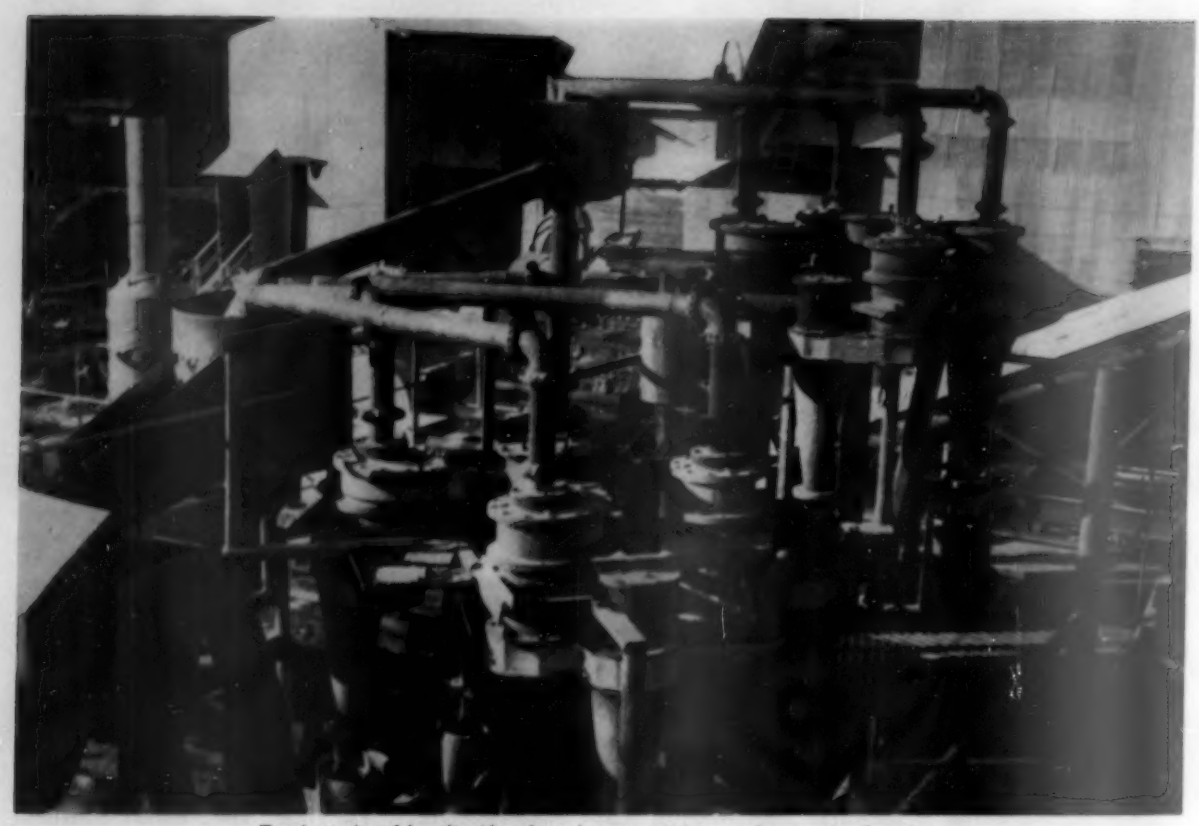
in 1926 by C. T. W. Hollister of Seattle, chairman of the executive committee, and the dean of the cement industry on the Pacific Coast. James D. Burns, of Condon, Oregon, is chairman of the Board of Directors. Gordon Tongue of Seattle, president, has been affiliated with the cement business in Seattle for 40 years. Don G. Metcalf, of Seattle, is secretary-treasurer. Lowell E. Northrop is in charge of sales. Board members include Frank Kiernan, Jr., and James L. McGinnis, both of Portland, Ore.; Dr. Paul Vogt, The Dalles, Ore.; Harold Shefelman and Paul Giese, Seattle; and Reno Odlin, Tacoma.

●

General Portland Cement Co., Chicago, Ill., will spend more than $1.5 million in an expansion and rehabilitation program at its Chattanooga, Tenn., plant.


PRIMARY HOPPER
4'X12' SCALPER SCREEN (DRY)
20"X36" JAW CRUSHER
STATIONARY MAGNET
RECIPROCATING FEEDER
GROUND STORAGE -1½" OR AS REQUIRED (ROAD STONE)
3-DECK 4'X12' VIB SCREEN (DRY)
30"X16" ROLL CRUSHER
GYRATORY CRUSHER
36" BELT CONVEYOR
RETURN BELT
4'X12' SCREEN (WET)
100% CRUSHED GRAVEL & SAND SECTION (DRY)
GROUND STORED OVER RECLAIM TUNNEL
GROUND STORED OVER RECLAIM TUNNEL
SAND GROUND STORED
TO BLACK TOP PLANT
24"X22' TWIN SAND SCREW
RECLAIM TUNNEL
TO READY MIXED CONCRETE PLANT ALONGSIDE (NOT OWNED BY REDDING S&G CO.
TRUCK LOADING

Flowsheet of crushing, screening, washing, and stockpiling operations



Two batteries of four liquid cyclones have an attrition and separating function

Make GLASS SAND by Removing Clay With Screens, Scrubber and Cyclones

ABOUT THREE MILES east of Oceanside, Calif., in Loma Alta Canyon, is located the highly diversified plant of Crystal Silica Co. Oceanside is north of San Diego some 35 miles. The plant produces glass sand, filter, gunite sand stucco and a wide variety of high silica sand specialties. Shipments are in car lots and in either bulk or paper bags. The plant is on the rails of the Sante Fe railroad.

The company controls a large acreage, most of which is a future source of high grade silica sand. Mining operations are about a mile west of the plant at a side-hill pit. The bed of sand is in the 20 to 30-ft. range and seems to follow the contour of the gently sloping hill. Wooldridge Terra Cobra Carryalls deliver the raw sand to the plant.

Pit run material is white in color with very little discoloration noticeable. The finished and washed sands are pure white. The main purpose of the washing plant is to reduce the clay content, and as the clay carries the burden of the iron, its removal also lowers the iron content of the pit-run. A rather intricate washing and rinsing operation eliminates 21 percent of the material going to the plant, practically all of which is feldspathic clays. The finished sand runs from 4 to 6 percent Al_2O_3, with the iron content low enough to make the sand acceptable for most glass manufacturing purposes.

Close-up details of liquid cyclone

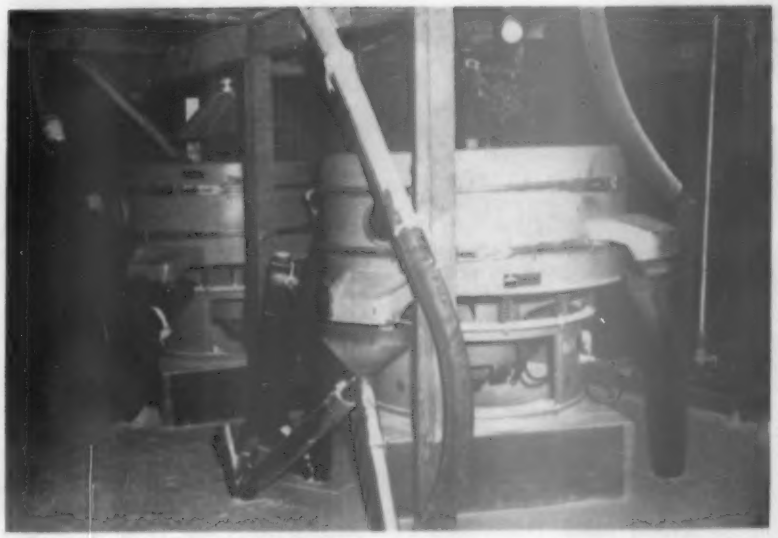
Washing and Screening

Briefly, the washing consists of a trommel followed by three octagonal (Heller) rotary screens that remove the plus 4-mesh and discard it as a clay waste. There are no other wet screens in the plant, with all later screening being dry. The wet section of the plant produces one product only; a clean low-iron, low-alumina sand for the rotary dryer, following which the sand is dry screened on a battery of 21 Southwestern, circular, vibrating screens or sifters.

Minus sand from the Heller screens goes to a sand wheel, followed by a

• Crystal Silica Co., Oceanside, Calif., uses intricate washing and rinsing equipment to produce sand low in aluminum and iron oxides

By WALTER B. LENHART



Two of a battery of 21 vibrating screens or sifters

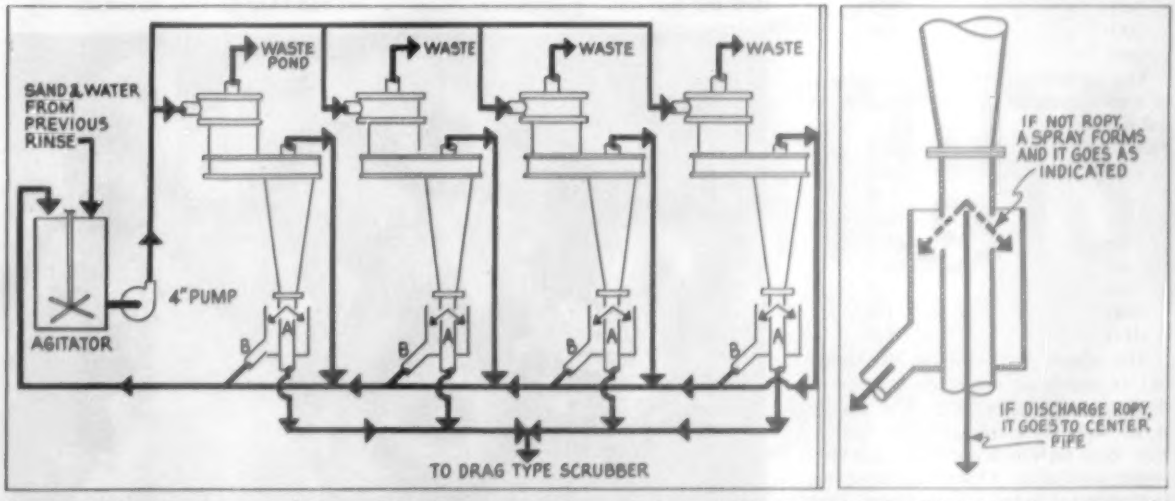
drag-type scrubber and an agitator from which it is pumped to a battery of four Krebs liquid cyclones. The finished sand from the liquid cyclones flows to another drag-type scrubber and agitator from which the sand is again pumped to a second battery of Krebs liquid cyclones. The finished sand from the cyclones goes to two rake type classifiers operated in series, the sand from the No. 2 rake being diverted to a battery of four sand rakes, two groups of two, that operate in series. The sand from the last two rakes goes to a third agitator from which it is pumped to a 20-in. Sand Cone Separator Co. liquid cyclone that acts as a de-watering cone. The sand wheel delivers to a belt conveyor system serving the storage piles. In all of these treatments: sand wheels, drag-scraper agitators, Krebs cyclones, rakes, agitators, and the 20-in. cyclone, waste waters carry away variable amounts of clay.

Liquid Cyclone Operation

The new and unique feature of the plant is the use of the liquid cyclones. Their purpose here is to make a sand-slime separation and at the same time to let attrition conditions within the cones have full play. Due to the high velocity of the pulp in the cones, and their relatively low water content, rubbing of sand grain against sand grain, plays an important part in the grain cleaning operation.

The Krebs liquid cyclone is a western development of Equipment Engineers, Inc. This same company pioneered the Centriclone which was described in the ROCK PRODUCTS, July, 1953 issue, page 62, where the units were in use in the wet grinding section of a portland cement plant. This liquid cyclone is a small, rubber-lined, compact unit that is essentially two cones operating in series. Pulp is pumped tangentially into the first cylindrical section. This cylinder produces a "primary" overflow that contains most of the slimes. The coarser sand fractions then pass into the second section which is a true cone. Here a finished sand is ejected at the lower cone apex, and a "secondary" overflow removed from the top of the cone. Either the primary or secondary overflows can be rejected as waste, or re-cycled. At the Crystal Silica Co. operation there are two batteries of four cones each. One 4-in. Galligher pump serves four cones that operate in parallel. It was said that a 2-in. pump would feed one cone adequately. The primary overflow is sent to the waste settling pond and the secondary overflow is re-cycled. The liquid cyclones are designated as Model EE10-9.

The finished sand from the first four cones is rinsed and re-scrubbed in a drag-type scrubber, and sand from the scrubber is re-pulped in a paddle-type agitator and again pumped to the second battery of four cones that operate similar to the first battery. The drag-type scrubber is essen-



Flowsheet of liquid cyclone installation and detail of one unit. A ropy discharge at 80 percent (plus) solids goes to drag-type scrubber. Minus 80 percent solids forms a spray that is returned to cyclones

tially a sand drag of conventional design. It emphasizes de-watering with possibly a nominal scrubbing action.

The discharge from the Krebs cyclone if kept at 80 percent (or higher) solids has a "ropy" discharge. This ropy discharge falls straight down where it is received by an open-end pipe and conveyed to the next rinsing operation. If, for any reason, one or all four cones start producing a discharge that is lower than 80 percent solids, the discharge mechanism of the cone is such that the more liquid pulp is ejected as more of an umbrella-shaped violent spray and as such is received by a funnel-like arrangement that surrounds the inner receiving pipe. The thinner pulp then can be re-cycled, or by-passed. Three cones can be ropy and the fourth a spray.

The feed to the cones is from 28 to 33 percent solids. Originally the sizing was at 200 mesh with about 25 percent solids and operated at 23 p.s.i. The present objective is about an 80-mesh cut and 33 percent solids at 16 p.s.i. By operating at a higher density, slimes are removed as well as a high percentage of undesired fine sand. With a higher pressure but with a diluted pulp, a much higher percentage of fine sand is recovered. About 15 t.p.h. is handled per cone.

The feed to the first Krebs cyclone battery is about as follows:

Mesh	Weight Percent
4	0.3
6	2.6
8	6.9
10	10.0
14	11.2
20	7.3
28	10.2
35	8.4
48	9.5
65	6.3
100	5.2
200	4.6
-200	17.5

The underflow from the last battery of Krebs cyclones is approximately as follows:

Plus 12 mesh	23.5
16	24.0
20	6.0
30	16.0
40	13.5
60	10.0
80	3.0
100	1.0
-100	3.0

The clean, wet sand is stockpiled by an overhead conveyor system to three ground storage piles. Reclaiming is by a novel drag scrapper device. The drag section resembles a conventional sand-drag. This drag, however, is suspended from a long boom. One end of the boom is fastened to the cab section and the other end hung by cables from the superstructure. The cab and entire assembly can be moved laterally, the conveyor boom raised or lowered, and its f.p.m. varied to meet feed conditions. An operator is stationed in the cab at all times; however, he can leave the unit unattended for short periods of time. The drag delivers to a belt conveyor system serving the dryer.

Dried sand is screened in a battery of 21 Model D-2D8 Southwestern 48-in. dia., circular sand screens. The screens are double-deck, and fed in the center with the oversize discharged at the periphery. They operate flat and with a relatively high speed (1200 r.p.m.), gyratory motion. The screening is more of a sifting action. One screen handles upwards of 2½ t.p.h., depending on the size which at this plant is from the 10-mesh through 60-mesh range. Stainless steel wire is used for the most part. Better screening efficiency was obtained by the use of this type of screen over those formerly used; i.e., less unwanted oversize and undersize in the finished products. Capacity increases, at the same time, were about 50 percent. Screen life is in the 5000-hr. range. The screen is a compact, self-contained unit, and comes from the factory ready to operate. In 1952, the company had nine of these screens but now use 21 with one more contemplated.

The Crystal Silica Co. has recently established a testing and control laboratory at the operation and plans are on the drawing board for a froth flotation plant. Early tests by competent flotation testing laboratories indicate that a glass sand in the .015 percent iron range can be produced from raw material, and the feldspar content lowered considerably.

Wayne Harper is president and general manager of the Crystal Silica Co., and Richard Harper is sales manager. J. C. Kite is production superintendent; W. T. Borden is plant superintendent; Gene Hendrickson is chemist, and J. L. Everitt is dispatcher.

Shale Institute Changes Name

EXPANDED SHALE INSTITUTE, Washington, D. C., changed its name at the annual meeting in New Orleans.

The name of the Institute was changed by action of the board from Expanded Shale Institute to Expanded Shale, Clay and Slate Institute.

The technical problems committee, headed by Cedric Willson, Texas Industries, Inc., reported on current and future research projects of the Institute. The committee also discussed projects sponsored by other organizations being conducted on aggregates of members of the Institute.

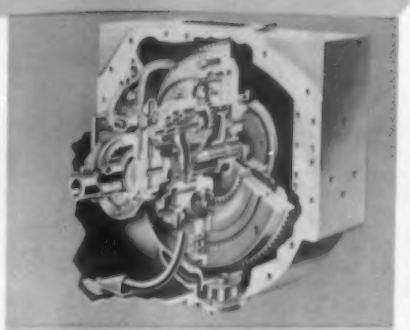
The promotion committee reported that the Institute's publication, "Concrete Facts," has reached a circulation of 50,000. This mailing list consists mainly of architects, engineers, contractors, block manufacturers, institutions of higher learning, and bank and mortgage companies. It was reported that an Institute movie will be released.

The Bylaws were amended in order that the annual meeting be held in the Fall. The next one will be in Rapid City, S. D.

New officers of the Institute elected at this meeting were W. W. Allen, president; Alex R. McVoy, first vice-president; William H. Thomas, second vice-persident; A. R. Waters, treasurer; and Otto C. Frei, secretary.

Banquet at the annual meeting of the Expanded Shale, Clay and Slate Institute

40-DEGREE BUCKET TIP-BACK AT GROUND LEVEL assures large loads every pass!



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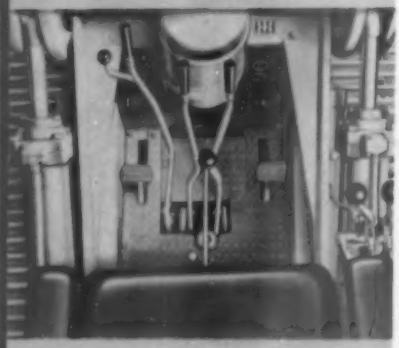
HIGH REACH with box-section lift arms for rugged service. Cross brace prevents twisting!



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Flywheel HP at sea level	70	50
Bucket capacity, cu. yd.	1½	1
Bucket tip-back at ground level, degrees	40	40
Bucket tip-back at max. lift, degrees	47½	48
Dumping height (center of hinge pin to ground)	128"	118½"
Weight (approx.) lb.	21,480	15,500

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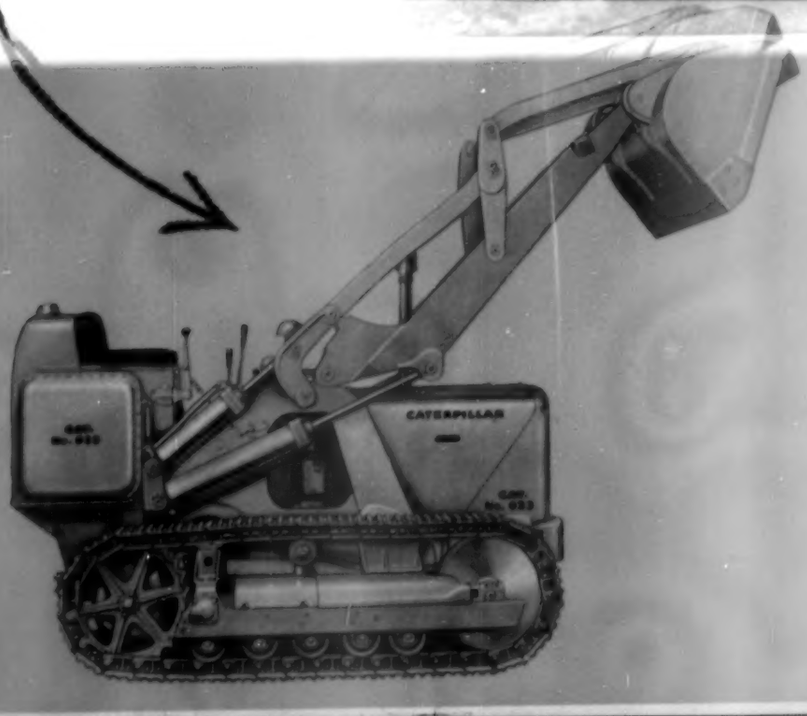

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1-yd

"Big production" features of the new CAT No. 955 and No. 933 Traxcavators

40-DEGREE BUCKET TIP-BACK AT GROUND LEVEL. Tip-back action at low bucket height results in maximum possible loads every pass in any material—bigger production per day!

NEW OIL-TYPE CLUTCH. Stands up under continuous repeated use. Cuts maintenance costs and time two ways. (1) Clutch adjustment, while easy, is seldom required. (2) Plate replacement is often unnecessary even at engine overhaul.

Also helps step up production by providing easier shifting for operator!

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PLENTY OF POWER. Power is ample to "bury" the bucket and provide fast lifting action and positive dumping under all load conditions.

"DESIGNED-IN" COMFORT. Operator sits high, with excellent visibility of all bucket positions. All controls easy and convenient to operate—bucket control a one-hand operation! Pilot-house visibility—leisure-chair comfort.

PERFECT BALANCE. Weight distribution, engine horsepower and bucket capacity are balanced so that the full length of the track stays on the ground with a heaped load in the bucket.

NEW 3-GROUSER TRACK SHOES. Tested and proved on tough jobs, they deliver better traction—longer life!

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VERSATILE ATTACHMENTS. Your job range is increased by a variety of buckets and other useful attachments.

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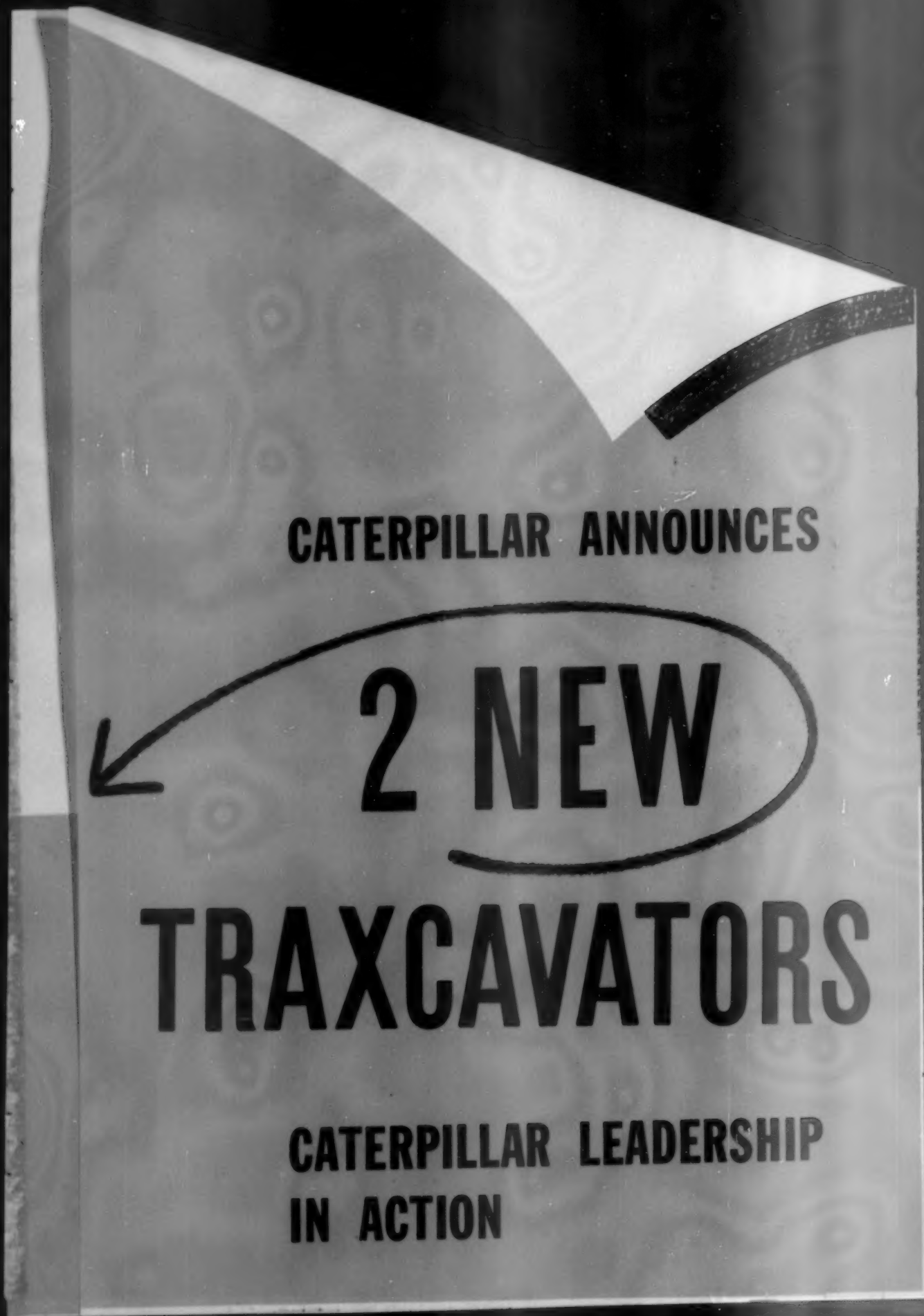
CATERPILLAR ANNOUNCES
2 NEW
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IN ACTION

Crushed Stone Association Directors

Discuss Blasting Problems—Engineering Research

A LARGE MAJORITY was present at the annual mid-summer meeting of the Board of Directors of the National Crushed Stone Association held at Hot Springs, Va., July 14 and 15.

Most of the business transacted was routine but there were several reports of special interest. Chairman Warren C. Rowe, Malden, Mass., and his Subrogation Committee have been extremely active since his last report and much progress has already been made to the elimination of a problem that was growing serious.

The problem has stemmed from comprehensive insurance coverage held by home-owners, where home-owners are collecting from their insurance carriers for alleged damages from blasting under a clause which covers damage from "explosions." Efforts are then made by the insurance carriers to collect from quarry operators. This practice of the insurance company substituting as a creditor for the home-owner is defined legally as "subrogation."

In many cases the carriers have been paying off home-owners where the claims of damage have been false, and without any effort to substantiation of the claims. Lack of knowledge on the part of insurance companies, of the improvements in and control of blasting techniques so that vibrations fall within safe allowable limits of vibration which are proved to do no damage to homes is behind the trouble. Carriers have been woefully ignorant of the case histories already established by the crushed stone industry.

Education of the insurance profession is the aim of the committee and a great deal is being done with encouraging results.

Mr. Rowe was asked by a large producer of lime and limestone products to be present at a conference held in June at that company's plant. Some 100 claims for alleged damages had been filed involving this company and there were 27 experts, scientists and insurance company men present to witness tests on vibration in the field. A micro-barograph was used for measurement of vibrations.

The adjusters got an education that opened their eyes and the findings are proving of national importance. A blue ribbon committee is to work with the National Board of Fire-Underwriters to formulate some ground rules later in the year involving the quarry industry as a guide for adjusters and claim agents.

Mr. Rowe told of results obtained in his own state through the Massachusetts Crushed Stone Association of which he is president. Revised rules and regulations governing the use of explosives and setting up allowable limits for vibration were issued by the Commonwealth of Massachusetts on August 5, 1954, proving that the Massachusetts Department of Safety officially recognizes the modern approach to the use of dynamite and the high degree of vibration control exercised by the industry.

The Massachusetts association held a conference on vibration this past winter and invited insurance men to participate. This resulted in favorable publicity. It has put out a notice to adjusters, warning their companies that producers will resist subrogation claims based on payments made by the carriers in settling "explosion" claims for alleged damage. Recently, the producers' position was expressed in an article, "Don't Pay Blast Claims, Blaster Tells Insurers," published in *The Standard*, New England's insurance weekly.

Mr. Rowe was applauded by the directors for his efforts and accomplishments in this field.

Staff Reports

Progress reports of the engineering director, A. T. Goldbeck, field engineer J. E. Gray and administrative director J. R. Boyd were heard.

Mr. Goldbeck covered a year's activities and stressed particularly the more significant problems requiring engineering research. The more serious problems have to do with alkali-aggregate reaction, the problem of slippery pavements and certain specification problems including gradation and flat and elongated particles.

He brought up-to-date the latest theories on the alkali-aggregate problem, one of which is that most kinds of silica are suspected to be reactive and particularly fissured quartz. Low amounts of alkalis in the cement (less than 0.6 percent equivalent Na_2O) are found to result in expansion. Tests in the laboratory indicate clearly that the use of pozzolanic additions can be curative.

The matter of slippery pavements is being thoroughly studied and definite ideas to minimize the problem are being developed. The laboratory has been engaged in some 40 projects this past year, some of general interest to all producers and others for the purpose of helping individual member producers.

Mr. Goldbeck reported on his activities and findings as head of the Committee on Materials for A.R.B.A. in connection with the tremendous highway program that has been pushed by the administration in Washington. He also summarized his other special activities and field trips. He advocates

Four old-timers got together for a picture. Left to right are board member O. M. Stull; past president and honorary director H. E. Rodes; treasurer James Savage; and J. A. Rigg

The executive committee of the Manufacturers Division met at Hot Springs to discuss exhibit plans and other business. Left to right are L. A. Eiben, Wayne King, B. R. Maloney, I. F. Deister and R. D. Ketner

that the association do more collective and forward thinking in observing the trends in construction and in specifications for the industry's materials.

Field engineer J. E. Gray continues to spend the bulk of his time in the field, in contacting purchasing agencies, producers and local and state groups in the industry. Mr. Gray has found that requirements as to soundness of crushed stone are more troublesome than any other physical properties. He gave some cases to point up the problem and to demonstrate how research is being applied to solve it. Chert continues to be a perennial problem. He covered this subject by citing instances related to durability of stone, slipperiness and shape of particle. The latter was referred to as "the meanest technical problem," because there still is need for a generally accepted definition of a particle shape that may be satisfactory.

Among trends in construction of roads is one wherein stabilized or graded aggregate base construction is being specified instead of water-bound macadam. Another is toward bituminous concrete base courses in place of penetration macadam.

J. R. Boyd, administrative director, discussed at length the various bills that had been proposed in Washington for the multi-billion dollar highway program. Whatever the fate of the program that may eventually come out of it, the expenditures for highway construction and maintenance in the 48 states are materially up for 1955 as compared to 1954.

Mr. Boyd believes it would be timely for the association to consider the possibility of revising the Cost Accounting Manual to bring it up-to-date. Total active membership was reported as 135 producers and the associate membership totals 109.

The by-laws of the association were amended to provide that regional vice-presidents, of which there are nine, be elected by a plurality vote of the directors in the respective regions, and that honorary members on the executive committee be eliminated. Nelson Severinghaus, Consolidated Quarries Corp., Decatur, Ga., was elected regional vice-president for the Southeastern Region filling the vacancy resulting from the death of L. J. Boxley.

Russell Rarey, chairman of the percentage depletion committee and of the N.C.S.A. conference committee with N.A.L.I. reported for both activities. There was little new to be said about percentage depletion since the revenue bill has not yet been issued. It was suggested that producers be guided by their tax counsel in making out their returns in the interim.

As far as conferences with N.A.L.I. are concerned, Mr. Rarey said that a trend to selling more roadstone by members of N.A.L.I. had resulted in a desire and need for technical services in the field of crushed stone by members of that group. Such services being unavailable, an approach has been made in an endeavor to develop a plan to make them available through N.C.S.A., which has the facilities. Discussions thusfar have not materialized and a new committee of N.A.L.I. is developing sentiment from its membership as to needs for engineering and laboratory service. The two associations thusfar have reached no common ground although there likely will be further discussion later.

Chairman Wilson P. Foss, III, of the public relations committee, following discussion with a New York concern, brought up several plans that had been suggested to get the story of the industry across to the public. An appropriation was voted to start action and there will be further discussion later as to the desirability of enlarging the program.

Chairman H. H. Kerwin of the accident prevention committee presented a summary of returns from a questionnaire sent to board members, requesting information to guide the committee. The majority of companies pay for safety wearing apparel and all who responded make use of such clothing. One-third have active safety contests and about one-fourth have a safety supervisor. Mr. Kerwin pointed out that those with safety supervisors have the best safety records.

He also had a tabulation of the safety record for participating companies in the safety competition for the last several years. Progressive improvement was noted.

The executive committee of the Manufacturers Division held a separate session and the discussion was almost entirely about plans for the 1956 machinery exposition which will be held in connection with the 39th annual convention of N.C.S.A., February 20-22 at the Conrad Hilton Hotel, Chicago, Ill. This is the week following the exhibits of the N.S.G.A. and the N.R.M.C.A. at Chicago's Coliseum. T. C. Cooke, president and chairman of the board, presided for the meetings of the N.C.S.A. directors. Among veteran members in attendance was past president H. E. Rodes, Nashville, Tenn. Mr. Rodes is an honorary member of the board as is Stirling Tomkins who also was present.

The 1957 annual convention will be held at Miami Beach, Fla., the week of January 13. Convention hotels will be the Saxony, Sans Souci, Sea Isle, and Seville. The Board voted to return to The Homestead, Hot Springs, Va., July 11 and 12, for its 1957 mid-year meeting. The 1956 mid-year meeting of the Board will be held at the Lake Placid Club, Essex County, New York, July 12 and 13.

Percentage Depletion of River Gravels

REVENUE RULING 55-251, published recently in 1955 Internal Revenue Bulletin No. 18, states that a producer who dredges sand and gravel from the bed of a navigable river under a Federal permit is not entitled to percentage depletion as a result of the permit alone. The reason is that the permit merely constitutes a waiver by the United States of any objection based on control by the U. S. over navigation, but which does not otherwise give to the taxpayer any legal right nor economic interest in the deposit. The ruling also states that depletion is not allowable on spoil banks built up during previous dredging operations.

However, there are circumstances under which a producer working in navigable waters might be able to establish an economic interest in the deposit which would entitle his company to percentage depletion.

General view during construction showing expansion of facilities for greatly increased production

Mammoth cranes used in erecting Kennedy 36 inch primary gyratory crusher

Giant receiving opening in new Kennedy 36 inch primary gyratory crusher

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and again chose

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KVS engineers recommended the right equipment . . . developed flow charts . . . helped Somerset plan their new plant that exceeds rated capacities in all departments and operates at costs that are lower than original estimates.

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Modern Cement Shaft Kiln Has Low Installation Cost

• Improved grates, nodulizer and burning techniques in Germany have resulted in higher quality clinker made in shaft kiln

By DR. EBERHARD SPOHN*

Fig. 1: Half burned pellet with pulverized coal coating

TODAY'S MODERN CEMENT SHAFT KILN has the lowest installation costs of any kiln. However, its clinker quality and its coal consumption could be improved. In otherwise well operated shaft kilns, quality improvement may be directed toward correcting the ash content or toward the elimination of dense, reduced lumps which leave the kiln while still hot.

Ash Content

In a modern plant, raw mix proportioning should have a 1/10 percent accuracy in lime content. However, coal ash is inevitably added during the burning process. With a 10 percent ash content coal, about one percent ash is added to clinker, which can combine with about 3 percent additional lime. Thus a material displacement of the original lime fraction results; a displacement of an unpredictable degree, since unfortunately we are not always dealing with coal of uniform ash content. In recent years, high-grade coal was not always available and ash content varied between 5 and 50 percent.

Determination of free lime in clinker comes too late. Computation of the lime standard** from the clinker analysis or the "potential analysis" comes even later. It may also be misleading. Coal ash is not evenly distributed throughout the mass. Wherever there was a lump of coal, a pocket or nest of ash, residue now exists. Particle size of coal ranges up to 10 mm. and often to 15 mm. and more. Sometimes there are agglomerations of several particles of coal. Thus the resulting clinker is far from homogenous, as assumed in computation of lime standard,** but consists of low-lime spots and high-lime zones. This is clearly observed in thin sections under the microscope. To demonstrate what happens to such an ash pocket, one may place an ash pellet on a raw meal briquette and observe it burning at increasing temperatures. The ash particle melts partially at 1100 or 1200 deg. C.; i.e., at a temperature at which the raw meal briquette remains unsintered and porous. The melt is sucked in by the porous mass. A stain, as on a blotter, develops around the ash particle. Part of the ash remains unmelted even at high temperatures, when the cement mass is thoroughly sintered. This blotter action of the raw mass does not help uniformity of distribution. Both the un-melted and the absorbed components are distributed unevenly as stains.

In a shaft kiln, clinker is not exposed to a kneading action, as in a rotary kiln. Thin sections of clinker show invariably a coarser and more regular crystallization in a shaft kiln clinker than in a rotary kiln clinker. Shaft kiln clinker may be likened to an ice cream frozen in the refrigerator without stirring. Rotary kiln clinker may be compared to the fine-grained ice cream made in the hand mixer. The kneading action which does away with small inhomogenities is absent in the shaft kiln. Therefore, pockets are partially apt to develop here.

Reduction Phenomena

The second drawback of shaft kiln clinker comprises the reduction phenomena, which is perhaps even more annoying than the ash deviation. Reduced clinker combines with less lime than oxidized clinker. It will, therefore, develop unsoundness due to de-

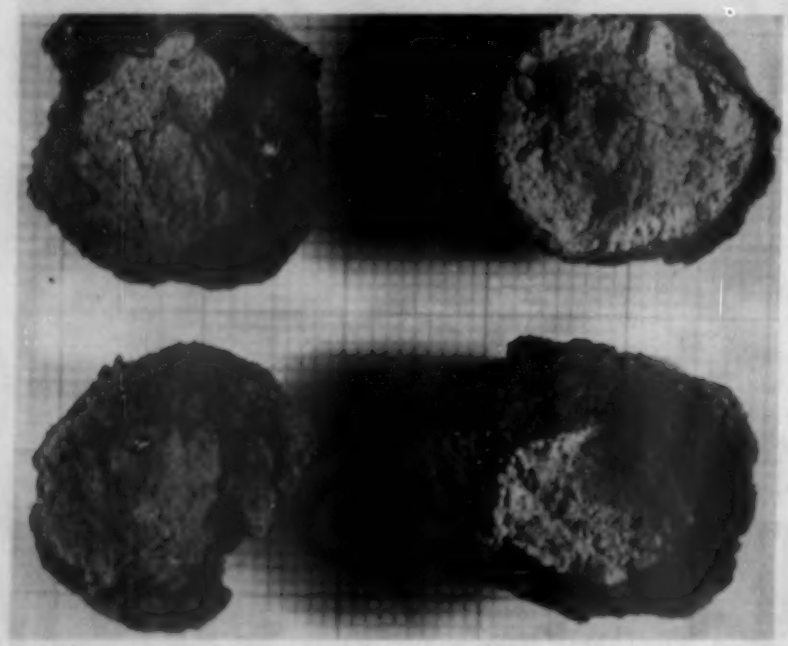

Fig. 2: Progress through the sintering zone within a pellet from the center to the outside

*From a paper delivered by Dr. Spohn at the meeting of the Zementverein (Cement Association) Aug. 10, 1954, in Baden-Baden. Dr. Spohn is identified with Portland-Zementwerke, Heidelberg Aktiengesellschaft, Germany.

**Reference is made to Kuehl's "Standard Lime"-formula, frequently used in Germany instead of potential analysis (Bogue's or Dahl's formula).

layed autoclave unsoundness. In addition, it has other disadvantages which need not be enumerated here.

For some time we have used the permanganate titration method to determine the degree of clinker reduction. Although the reduced substances include metallic iron, FeO, sulfides and many other compounds, the degree of reduction has commonly been calculated as though only FeO were produced. While this is incorrect, it affords an evaluation of the extent of reduction. For a good shaft kiln this average usually is about 0.5 percent fictitious FeO. Some kilns attain one percent and more. These are only average values. Actually clinker almost always consists of a mixture of good, porous, quick-cooled black pieces and of dense, reduced particles. Individual lumps show a considerably stronger reduction than shown by average analyses. From the foregoing it is clear that here also lime standard computations are a mere illusion. This applies as well to many rotary kiln clinkers.

Intergrinding of Coal With Raw Mix

One can see that ash deviation will be eliminated if raw meal and coal are finely ground together. The ash is then homogenously distributed and when a predetermined weight of coal is added before raw grinding takes place, ash components can be chemically accounted for at the feed opening. The acid-alkali method of lime determination must be replaced by the much better lime-deviation method. The lime-deviation method consists in adding a known quantity of lime to the raw meal, burning it in a special furnace and determining free lime by the Schlaepfer-Bukówski glycolate method. The titrated minus the free lime found gives the lime deviation, which may have a positive or negative sign.

This method has proved equally satisfactory for a raw mix containing pulverized coal. To eliminate reduction phenomena due to interground coal, some oxygen must be added during burning in the laboratory furnace. This makes it possible to attain a chemically perfect product with low grade coal of varying composition. A similarly good chemical product may be attained in the rotary kiln only with gas or oil firing.

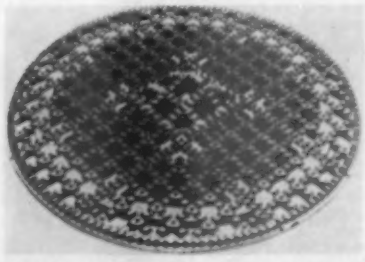

Fig. 4: Conventional type grate with openings

Practical Results Under Tests

Long before the last war we tried to burn such a mix, without immediate success. These tests were repeated many times, the latest being those of 1951 and 1952. They have invariably yielded the same unsatisfactory results, but led to some valuable discoveries. In one of the first tests, we used the Loesche two-roller press in preparing the kiln feed. The raw mix was briquetted on a perforated disk with 18-mm. openings. The briquettes

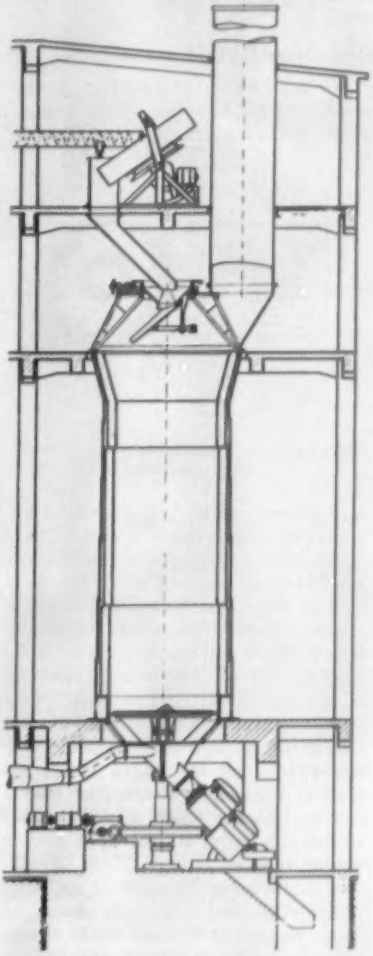

Fig. 4A: Shaft kiln with conventional type grate

were thus of the same diameter throughout and clinker measurements yielded fine studies of shrinkage during burning.

We established at the time that burning shrinkage is very different for pulverized or unground coal. For unground coal this linear shrinkage was 20 percent of the original size, a discovery which at that time led to the

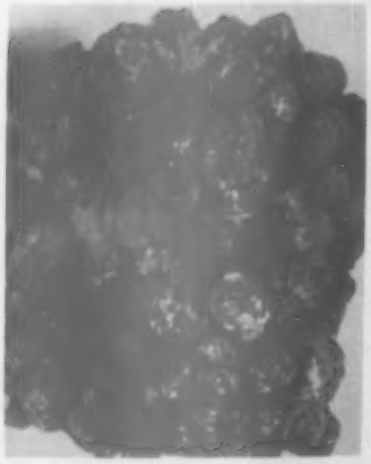

Fig. 3: Characteristic clinker structure calcined with pulverized coal

introduction of a funnel-shaped sintering-zone. By removing partially burned nodules through the top of the kiln, it was possible to observe the changes that occurred as a sample traversed the preheating, calcining, sintering and cooling zones. The end product was always uniformly shrunk and compacted by the burning process. The intermediate stages also showed uniformity. Such samples were either dried, calcined or completely burned; at most, the burning process was a bit more advanced on one side than the other. Shrinkage showed the expected intermediate stages.

Nodules burned with pulverized coal acted differently. Their shrinkage during burning was considerably lower, but they contained voids. It appeared as though shrinkage did not progress inward from outside, but proceeded in a reverse direction from center to outer shell. The resulting structure was not dense and hard, but extremely friable due to these peculiar voids and rapid cooling. The hypothesis that pulverized coal produces an entirely different reaction sequence is confirmed by further observations.

When partially-burned samples were removed from the burning zone, it was noted that they did not, as before, represent a definite burning stage throughout, according to whether they came from the drying, calcining or sintering zone, (Fig. 1). Most of them had an unburned core with a thin surface layer of clinker. Below this surface layer lay a millimeter-thin sheet of yellow underburned material, from which all the coal was burned; then came uncalcined, coal-containing meal and finally a core of violet color, which appears at 300 to 400 deg. C. The burning zones, which formerly were measured at least in centimeters, were not only reduced to millimeters or fractions of a millimeter, but were

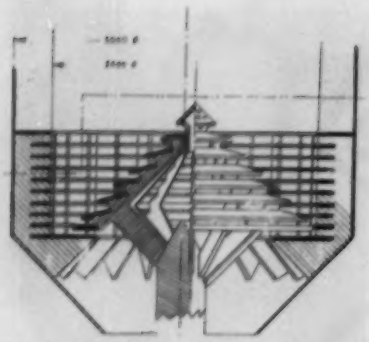

Fig. 5: Eccentric type grate with cage discharge assembly

represented in each individual pellet and progressed from the surface of the particle to the center until the entire pellet was thoroughly burned, Fig. 2.

This process explains the formation of voids. During burning the center shrinks outward toward the clinker shell, which is formed first. The clinker lumps have a friable structure after burning, built up of interlocking shells. Anyone who has observed this phenomenon recognizes at once that pulverized coal was used, Fig. 3. Examining the partially-burned pellets more closely, one comes to the conclusion that the at-one-time controversial Hauenschild reaction

$$CaCO_3 + C = CaO + 2\,CO$$

is of decisive influence here, for carbon dioxide and coal disappear simultaneously from the zone in question, which is a millimeter-thin layer on the granule. Obviously, the coal does not burn primarily with air, but with the carbon dioxide of limestone to CO, which escapes to the surface of the granule and only there combines with oxygen to burn to CO_2. Unburned coal residues are no longer found in overburned clinker, which are known to be the cause of a particularly strong reduction of surrounding material. The undesirable reduced clinkers are present in much smaller amounts.

Another striking phenomenon is that the clinkers no longer have the tendency to ball together into clusters during burning, nor burn into solid masses compacted by their own weight. The greater part of the clinker remains loose in the shape in which it was originally fed to the kiln, and where grape structure appears, it is very loose and friable and breaks down at the slightest impact. This seemed a rather encouraging observation at first, for our aim was to produce a loose, porous clinker, which would burn quickly and cool quickly, in contrast to the usual dense, hard clinker variety. However, this very fine, loose clinker revealed an annoying reverse side; the charge had become so loose, that channels opened up in it, and through them loose clinker could fall from kiln-top to grate without obstruction. The discharge gates became clogged and could not be closed. The fire zone was torn up and no stable firing could be maintained even with higher fuel consumption. This was observed throughout all early tests.

The foregoing observations leave no doubt that pulverized coal firing is basically a different process from the conventional coal firing, and requires a departure from old methods. Above all it became clear that the conventional grates were not capable of holding back the loose clinker product and of discharging it at a steady uniform rate.

New Grate Development

We now turn our attention to the grate. The old Grueber grates, Fig. 4, 4a, do not differ greatly from all other

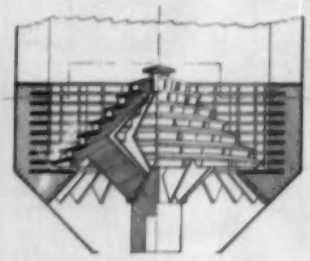

Fig. 6: Double-threaded screw grate with cage discharge

conventional types of grates. They hold back large, hard lumps, slowly reduce them to greater fineness through a rubbing action, and allow the fines to fall through. Material possessing greater fineness from the beginning falls through practically without interruption and travels through the kiln in a considerably shorter time. This condition could not be tolerated. We had to specify that the charge descend uniformly over the entire kiln cross section, regardless of the fact that a careless burner had allowed loose clinker to form at one spot and a denser one at another. This stipulation to discharge all material uniformly, whether hard or soft, dense or loose, seemed at first not easily attainable. In addition, air should be admitted uniformly over the entire cross section.

After many years of experimenting, we can now submit a result that includes several ways of execution. Clinker must be distributed and crushed over the entire kiln cross section, and the grate, which consists of overlapping parts, should not permit clinker to fall through. The clinker is directed toward a discharge which can be controlled and so adjusted to the crushing action of the grate, that an excess of fines is always retained, on which the kiln charge is based. We have attempted at first to build these grates ourselves. Later, when basic specifications were worked out, we entered into an agreement with a company† that met similar problems in building producer grates. The latter, however, are designed to fit different operating conditions and cannot be directly adapted to shaft kilns. Different types are shown in Figs. 5 to 11.

Results With New Grate

Tests using the new grate did not proceed without initial mechanical difficulties, yet it confirmed previous observations and deductions. A cold preliminary test was run with the kiln charged and discharged with finely broken-up clinker. An absolutely uniform descent of the material was successfully attained. Figs. 12 and 13 show that a match box remains undisturbed in one spot as the mass descends. Burning tests with coarse coal as well as with pulverized coal yielded a completely uniform continuous process. Possible weak firing spots no longer showed a tendency to break through, and such weak spots in the kiln sector were easily readjusted in the shortest possible time. This was a significant success, for up to now burners lived in fear that the combustion zone would lag at one side, and it took days to bring it around to normal. For this reason, precaution demanded, that one operate with an excess of coal, so that burners might rest easily, but this was costly and led to reduced clinker. The new grate permits operating near the bottom limit of coal consumption without fear of complications. Tests showed uniformity of kiln performance for conven-

(Continued on page 62)

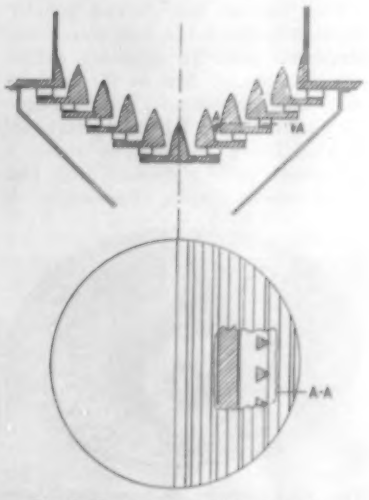

Fig. 7: Connecting-rod type grate

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Fig. 8: First screw type grate under test

Fig. 9: Bottom view of screw type grate

tional and pulverized coal firing not known heretofore with old methods.

When pulverized coal was used, the combustion zone at the periphery was not as high as before. Without knowing the cause, the burners reacted immediately, and were instinctively correct; they filled the kiln cone only to half. Peripheral and center flare were equalized. This was in agreement with our former observations, that burning shrinkage is considerably reduced with puverized coal firing. There is no doubt that the funnel shape of the burning zone should be adjusted to this.

A further observation was a reduction in coal consumption from 1100 to 960 kcal/kg clinker. This reduction was a surprise and was not immediately explained, as the clinker remained well burned. The explanation lay in a more uniform air distribution throughout the kiln. Exit gas analyses yielded practically the same CO concentration for center and periphery of kiln, while in the past we were used to no CO, but excess air at the periphery, while greater quantities of CO were found at the center.

Uniform kiln operation resulted not surprisingly in a clinker practically without underburned material and of unusually uniform properties. The greater part consisted of loose nodules and from a distance resembled the clinker of rotary kilns. Only relatively small portions were compressed to dense lumps and reduced. The average FeO content was 0.2 percent. Such a low value was never attained in the past, even as an exception. It was one third of the customary figure. The strength properties attained with pulverized coal cannot be reported at this time. It is to be expected that with the ash deviation eliminated, they would be considerably improved.

Unfortunately, we were not able in the tests to use the raw mix homogenizing silos. The test meal came practically unhomogenized from the raw mill. Its lime content had a variation of ± 3 percent, which is more than was formerly caused by the ash deviation, and correspondingly, a great number of the soundness tests were failures. In spite of this the same strengths were obtained as before. Under this handicap the latter was a good sign. Every shaft kiln expert knows how unfavorably are conditions in a shaft kiln with a poorly homogenized meal, not only directly for clinker composition, but also indirectly for uniform kiln operation.

At any rate it was proven that pulverized coal; i.e., no ash deviation, resulted not only in good clinker, but in a better clinker than before together with a lower heat input. This cannot be attained with the conventional types of grates. The new grate is the basic factor for this improvement.

†Loesche, Duesseldorf, Germany.

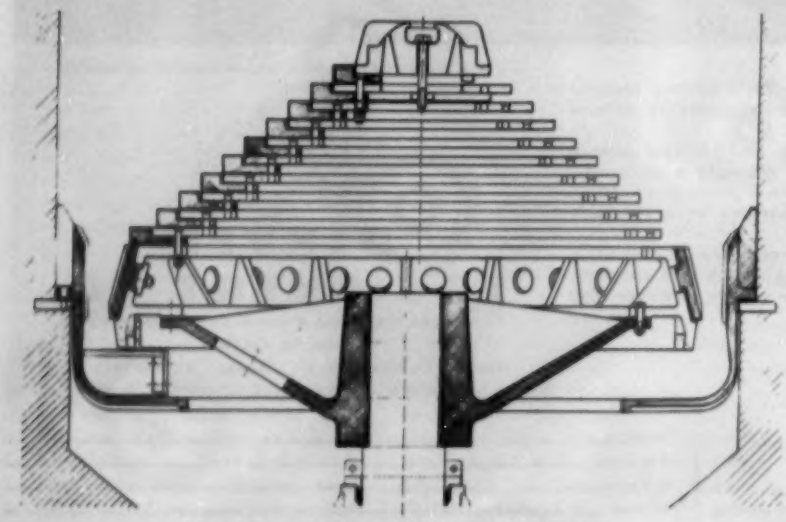

Fig. 10: Cross section of an efficient grate design

Dish-nodulizer

While formerly combustion zone length, reaction rate, etc., depended largely on the size of coal particles, which was often completely uncontrolled, the nodule size has now become the main factor influencing combustion zone length. Nodules of walnut size produced so long a flame that the grate became hot. On the other hand, very fine particles of only a few millimeters, produced in a screw conveyor mixer, resulted in so short a burning zone that a continuous firing zone could not be stabilized and operation was impossible. The nodulizer proved to be an ideal device at this point. It not only furnishes pellets of uniform size, which permit passage of the optimum air supply, but also allows a variation in pellet size to fit as yet unknown conditions. Proper pellet size is far from definitely known. Optimum kiln height and shape are contributing factors, so that the dish nodulizer appears indispensable in the near future, as it was for the present tests.

(Continued on page 65)

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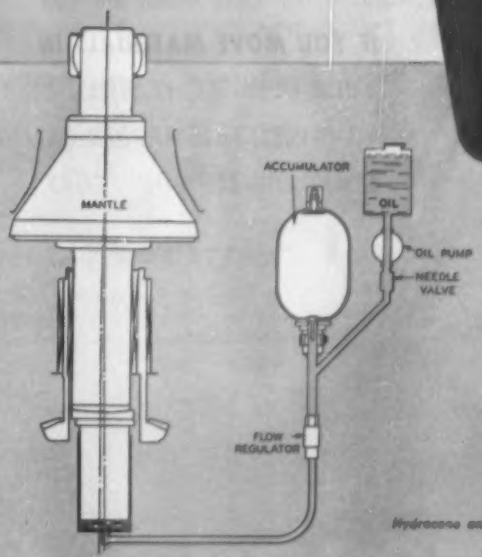
Simplified Compensation for Wear—Compensating for wear on concaves and mantle is equally as fast and convenient. A push of a button on large *Hydrocone* crushers or a move of the hand control on smaller sizes does the job.

Fast Emergency Unloading and Tramp Iron Protection — If crusher stops abruptly because of power failure or other emergency, *Speed-Set* control facilitates fast clearing of crushing chamber.



How *Speed-Set* Control Works

Mainshaft assembly is supported on hydraulic jack. Oil pumped into or out of jack raises or lowers crushing mantle.

When tramp iron enters crushing chamber, oil from jack is forced into accumulator, allowing mantle to lower. Automatic reset returns cone to original setting after tramp material is passed.

For complete information, see your A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 07B71458.

A-4478

Hydrocone and Speed-Set are Allis-Chalmers trademarks.

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But it is in performance that your savings are greatest because there is no more economical method of moving material than with a Barber-Greene Standardized Conveyor. Power costs are low—maintenance is minimum—production is constant. Why not take advantage of Barber-Greene's broad experience the next time you have a material handling problem.

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Barber-Greene

AURORA, ILLINOIS, U.S.A.

CONVEYORS LOADERS DITCHERS ASPHALT PAVING EQUIPMENT

Modern Shaft Kiln

(Continued from page 62)

Theoretical men who so far have rejected as uneconomical firing with interground coal, seem to have been decisively contradicted. It must be admitted, however, that they are not entirely wrong. Their vindication is still found in the everpresent high CO-concentration of the exit gases. The shaft kiln, in accordance with its basic principle, is always a carbon monoxide producer, and it is simply not capable of 100 percent combustion. This is clear when shaft kiln firing and rotary kiln firing are compared. Rotary kiln firing is based on a direct current principle. Air and coal are injected together in a common stream, and heated and burned. The ratio of coal to oxygen is maintained at the same rate throughout the burning process. Grate firing operates according to the same principle. By varying the blast velocity or the quality of the fuel, the fuel-air ratio can be varied at will. This is different in the shaft kiln process which is based on the counter-current principle. At the cold feed opening there is a constant excess of fuel; at the grate, an excess of oxygen. Stronger or weaker blast has no effect on the fuel-air ratio; it only alters the velocity of the combustion. A reducing atmosphere prevails in the preheating zone, and an oxidizing one in the cooling zone. Somewhere in the firing zone must be located a neutral atmosphere.

Let us follow the progress of fuel-raw meal nodules through these zones. At first, they are heated along the surface by the hot combustion gases. These gases no longer contain oxygen, but have a high CO_2 concentration. As soon as a certain temperature is reached at the surface of the granules, perhaps 600 to 800 deg. C, the surface coal reacts with the circulating gases according to Boudouard's equation: $CO_2 + C = 2\ CO$. The CO quickly escapes to the cooler layers. It can not burn further due to lack of oxygen.

From the preheating zone the nodules, whose surfaces are now devoid of coal, enter the deeper, oxygen-containing burning zone. In the meantime, the inner layers of the granules begin to attain reaction temperatures. The coal reacts with the carbon dioxide set free from the limestone according to Hauenschild's equation:
$C + CaCO_3 = 2\ CO + CaO$. The CO thus formed escapes towards the surface of the granule and there encounters O_2, with which it reacts to burn further to CO_2. The trouble is that the preheating zone comes in contact with the O_2-free, but hot, exit gases. This should be avoided. Coal should pass through the preheating zone and reach the burning zone in a gas-proof envelope to forestall the Boudouard reaction.

The Coating Process

This latter idea led to the coating process. It consists in coating the nodules with a coal-free shell of definite thickness. The thicker the shell, the more delayed is the coal reaction. One may expect that CO will still form when the shell is thin, but will disappear with correct shell thickness. Too thick a shell might even produce an excess of O_2 in the exit gases, as the coal enters the reaction so late that some oxygen escapes without reacting with it.

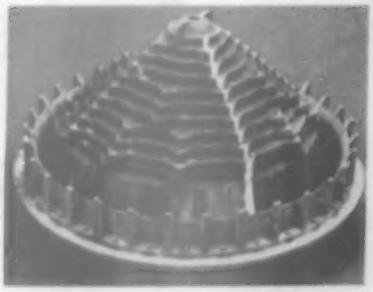


Fig. 11: Latest type grate being tested

The above theoretical considerations all indicate an optimum condition of granules which are not too small, are of one size throughout, and have a uniform shell thickness.

The requirements are not easy to fulfill. A coal-free shell is not achieved simply by powdering, as sometimes has been suggested when excess moisture was to be dried superficially. A true nodulizing process must take place with further addition of water and of a raw meal with its own different lime level, as it does not receive ash, like the meal at the core.

Fig. 13: Position of same box of matches shown in Fig. 12 upon descent of charge

If separate grinding and mixing of the two raw meals (one for the shell, one for the core) is to be avoided, there is a possibility of building up a coat of clinker dust which would correspond to the well known clinker recirculating process.

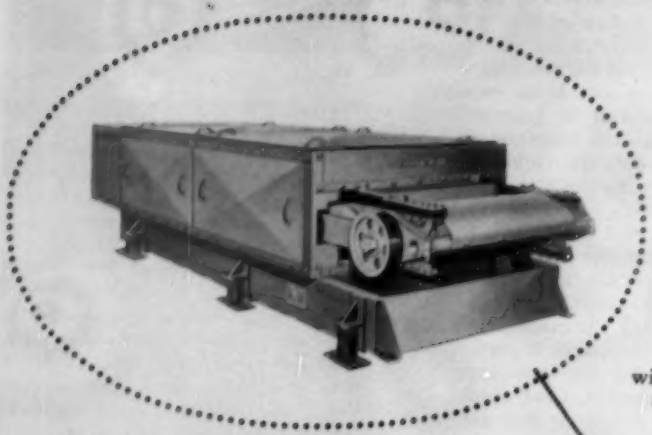
Experience With Coating Process

Our first tests did not produce a shell of required uniformity. Nevertheless, a report is timely, as the evidence is convincing, in spite of being incomplete. It shows that a superimposed shell of 10 to 20 percent raw meal is burned without additional coal consumption. We have attained an overall heat consumption which is 10 percent lower than in tests with pulverized coal without coating and is about 800 kcal/kg. clinker. A simultaneous reduction of CO in exit gases to three-quarters of its original volume took place. However, it still amounted to more than 3 percent, an indication

(Continued on page 67)

Fig. 12: Position of match box indicates uniform descent of charge over grate

Prominent Asphalt Plant Manufacturer Specifies SYMONS® *TYPE F* HORIZONTAL VIBRATING SCREENS



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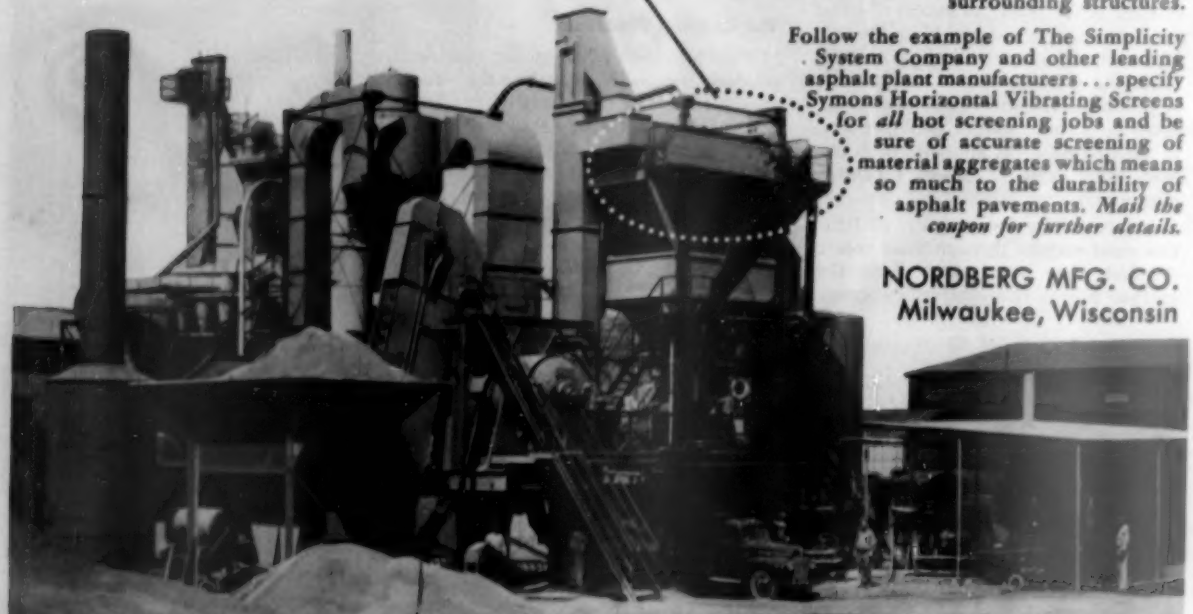

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that further improvement might be possible. An improved coating process will show how much further this may be carried. The somewhat cumbersome process involving two raw meals becomes economical because of the saving in coal.

Summary

Improvements of the shaft kiln in recent years may be summarized as follows:

In addition to the familiar clinker recirculating process (Rückgutverfahren) which—unaccountably—has not been introduced extensively in practice, and of a few improvements in discharge valves (Klappenverschlüsse), blowers, (Gebläsen) and proportioning equipment, the funnel-shaped sintering zone has been the principal improvement which, when well adapted, has been a real step forward. The next few years will see two important developments from which more can be expected: the use of pulverized coal, and the coating process. The latter is still in its initial stages. There is good reason to believe that the low figure of 800 kcal/kg. clinker may be decreased further. Application of experimental knowledge to plant operations may be slow. Kilns have to produce and can not be stopped for remodeling at present. Other problems remain. There is, for instance, actual automatic control of shaft kiln operation and the elimination of smoke nuisance.

1. Burning with pulverized coal has become an economical process due to the development of a new type of discharge grate. The clinker thus produced is free from inhomogenities and deviations due to coal ash. Also, the fuel consumption has been reduced from 1100 kcal with the conventional process to approximately 960 kcal/kg clinker with the new process.
2. A new burning process consisting of pelletizing and then coating the pellets by a coal-free shell permits an appreciable reduction of the CO-losses in the shaft kiln. A very crude test installation has showed already a fuel consumption of about 830 kcal/kg clinker. Further improvements of the process may be expected.

Irish Gypsum Exports

IRISH GYPSUM INDUSTRIES, LTD. recently exported gypsum wallboard and lath, costing approximately $250,000, to the United States. It was the third largest shipment sent by the Irish firm to Gulf ports in 1955. The company also ships to Britain and anticipates total sales of $750,000 on gypsum exports in 1955.

Haulage unit dumping to 5- x 16-ft. apron feeder ahead of primary 48- x 60-in. jaw crusher. Note the enclosed control station

Consolidated Increases Crushing Capacity and Adds Bins

TWO ILLUSTRATIONS show important steps in the improvement program undertaken at the Lithonia, Ga., plant of Consolidated Quarries Corp., Decatur, Ga.

One illustration shows a 5- x 16-ft. Telsmith apron feeder which feeds the 48- x 60-in. Allis-Chalmers jaw crusher. Installation of this feeder has increased capacity about 20 percent. An interesting feature of the installation is the enclosed control house which is so located that the operator can see all the important functions and be out of the weather and away from any dust. This feeder went into service during February of 1954.

The other illustration is an example of the trend in truck operations to eliminate loading by clam, shovel, or front end loaders in favor of loading trucks by means of steel overhead bins. The bins in the foreground are a part of this program. Over them is a 4- x 10-ft. Seco two-deck recleaning screen operated dry. Later this screen may operate wet.

In the quarry, three new Euclid rear dump trucks have been added to the fleet. The company now has five trucks of this type and three Macks.

The Lithonia operation is unique in that it uses jet piercing for primary drilling. This technique, involving the use of oxygen-coal oil flame to pierce a vertical hole in the granite rock, was described in ROCK PRODUCTS, April, 1953, page 132.

G. A. Austin is president of Consolidated Quarries Corp., and Nelson Severinghaus is vice-president and general manager.

Truck loading bins replacing other methods of loading. A screen is located over steel bins for re-screening

View of the whisk-broom clean Somerset plant taken during the open house on August 6. The new $400,000 stone plant facilities are in the foreground; old plant to the rear

Quarry Open House

SOMERSET CRUSHED STONE CO., INC., Bernardsville, N. J., held an impressive open house on August 6 to celebrate its tenth anniversary and to dedicate a new major addition to its trap rock crushing plant. A large open side tent was set up on the quarry floor adjacent to the plant to accommodate the crowd. Refreshments and music were provided. Among the special guests were the local mayor and U. S. congressman, various equipment manufacturers, quarry operators, contractors, and highway officials. Representatives of the New Jersey Department of Labor and Industry, headed by C. George Kruegger, deputy director of the bureau of engineering and safety, were on hand to demonstrate special safety and blasting vibration equipment.

Inspection was made of new crushing and screening facilities installed adjacent to the older plant. These include a 36-in. gyratory crusher, a double-deck scalping screen, a secondary gyratory crusher, and a triple-deck finish screen, the latter discharging its products to four stacker belt conveyors. According to Anthony Ferrante, Somerset owner, these new facilities, costing about $400,000, will enable daily production capacity to be increased from 3000 tons to 8000 tons. The company also erected a modern locker-shower room for its 110 employes. A complete story will appear in a later issue.

Anthony Ferrante, owner of Somerset Crushed Stone Co., Inc. (center), flanked by U. S. Congressman **Peter Freilinghusen** (left) and **Mayor E. M. Faulkner,** all of Bernardsville, N. J.

Saftey Congress Program

THE CEMENT AND QUARRY SECTION of the National Safety Council has announced its program for the 43rd National Safety Congress to be held at the Conrad Hilton Hotel, Chicago, Ill., October 18 and 19. Main speakers and subjects are as follows: Henry G. Lamb, American Standards Association, "A.S.A. Method of Recording and Measuring Work Injury Experience, Z16.1-1954;" George L. Kirp, Material Service Corp., Chicago, "How We Reduced Accidents Eighty Percent in Two and One-Half Years;" T. R. Donoghue, Pittsburgh Plate Glass Co., "Application of Color Dynamics in Cement and Quarry Industries," with 35-mm. colored slides; and H. F. Johnston, The Funkhouser Co., "Safety Ideas Illustrated." In addition, H. F. Stokes, C. R. Bulger, and A. S. Hetherington, of Universal Atlas Cement Co., Buffington, Ind., will put on a panel skit entitled "Getting Everyone Into the Act," which will describe the safety program successfully utilized by the company for sustaining employe interest in safety. T. W. Jones, New Haven Trap Rock Co., will preside at the C & Q session.

Eliminating Trouble In Processing Damp Stone

Letter to the Editor:

SIR:

In April 1951, you published an article on "Spreading and Handling Wet or Dry Agstone in New Zealand."

I think real help can be given to some companies by drawing attention to unusual ways of overcoming the problem of crushing and screening damp material, such as quarry run limestone, to a fineness of all through 8 mesh, 50 percent through 30 mesh.

The deposit we are working covers a very large area and is over 100 ft. deep and is comprised of broken shell cemented together into a tough monolithic block without fractures. We rip it out with Preco back rippers fitted to a D6 Caterpillar and a H.D. 15 Allis-Chalmers tractor. When ripped out from the mass the stone disintegrates mostly to pea size or smaller and the largest lump put into the crusher may be 12- x 12- x 24-in. Larger pieces are run over by the tractor to break them smaller.

It can be readily seen from the foregoing that we have a very easily worked quarry, but because of the relatively soft nature of the limestone it absorbs water readily, which can ordinarily be a serious handicap.

We mastered this difficulty by providing a set-up with three essentials:

(1) Automatic electrical control of the plant
(2) Installing a pan-mill
(3) Installing a winnowing classifier

Every operator knows that chutes will gum up with fine material cementing onto them no matter how steep the angle, so provision has to be made to correct the trouble automatically when it occurs. In the Hatuma Lime Co.'s plant every electrical motor is fitted with an ammeter and ASEA relays act on any over-load on any machine to shut off the feed and a warning bell rings. It is our opinion that no crushing plant can afford to be without this type of automatic protection and greater use should be made of the latest electrical devices now available everywhere for such uses. This electrical safeguard system saves time, temper, labor and money and ensures the maximum production from the plant.

The crushing of damp materials to 30 mesh presents a problem which we have overcome by installing a No. 11 (11 ft.) Bradley & Craven pan-mill with rim discharge. This mill is fitted with two 5-ton rollers which will crush the biggest pieces that come

(Continued on page 84)

A. P. Green

REFRACTORY PRODUCTS

SERVE THE WORLD'S INDUSTRIES

A Complete Line of Refractory Products for the Cement and Lime Industry . . .

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KRUZITE (70% Alumina)

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BIG CHIEF (50% Alumina)

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A. P. GREEN HOT ZONE

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ROTARY KILN
Its Performance and Development

READ THIS

. . . seventh in the current series covering features of the new modified Azbe rationalized rotary lime kiln system and advantages claimed over other rotary kilns. Matters of kiln capacity, fuel efficiency, operating temperatures, plant size, dust problems, and costs are covered.

By VICTOR J. AZBE*

ADVANTAGES OF THE MODIFIED AZBE RATIONALIZED ROTARY LIME KILN over the open type of rotary kiln are far-reaching with respect to increased capacity and costs of operation.

The Azbe kiln was conceived in an endeavor to find an answer to the disadvantages of the open-type of rotary kiln. These disadvantages are numerous: Close sizing of stone is required in order to produce good lime. Relatively low capacity is achieved for the size of kilns required. Fuel efficiency generally is low. High operating temperatures are required, and are the result in order to obtain sufficient capacity. Since 5 to 10 percent of production escapes as dust, abrasion is evident.

Operating costs are higher, not only with respect to fuel, but the cost of processing the stone is greater because of the necessity for screening into narrower size ranges. As a result of the additional complications of screening there are problems of multiple storing, handling and charging. The dust disposal problem is costly, and high temperatures send kiln upkeep costs up.

Furthermore, such plants cost more because a more elaborate stone preparation and storage system is required. The kiln is larger or more of them may be needed for required production. Fuel burning systems of larger capacity are needed, including auxiliary equipment such as fans and stack and other related equipment. The buildings and grounds also must be larger.

In previous articles of the series, the various phases of rotary kiln operation were discussed. Performance possibilities, and the reasons therefore, were given. These articles summarized the advantages of the segmented kiln over the ordinary rotary lime kiln. The Azbe patent for a segmented rotary kiln, No. 2,653,809, issued September 29, 1953, was drafted on the basis of principles outlined in these articles.

Fig. 42 shows details of the Azbe rationalized rotary lime kiln system featured in the application of 1949. However, since then there have been modifications which do not impair the claims that establish the principles.

(Continued on page 72)

*Pres., Asbe Corporation, St. Louis, Mo.

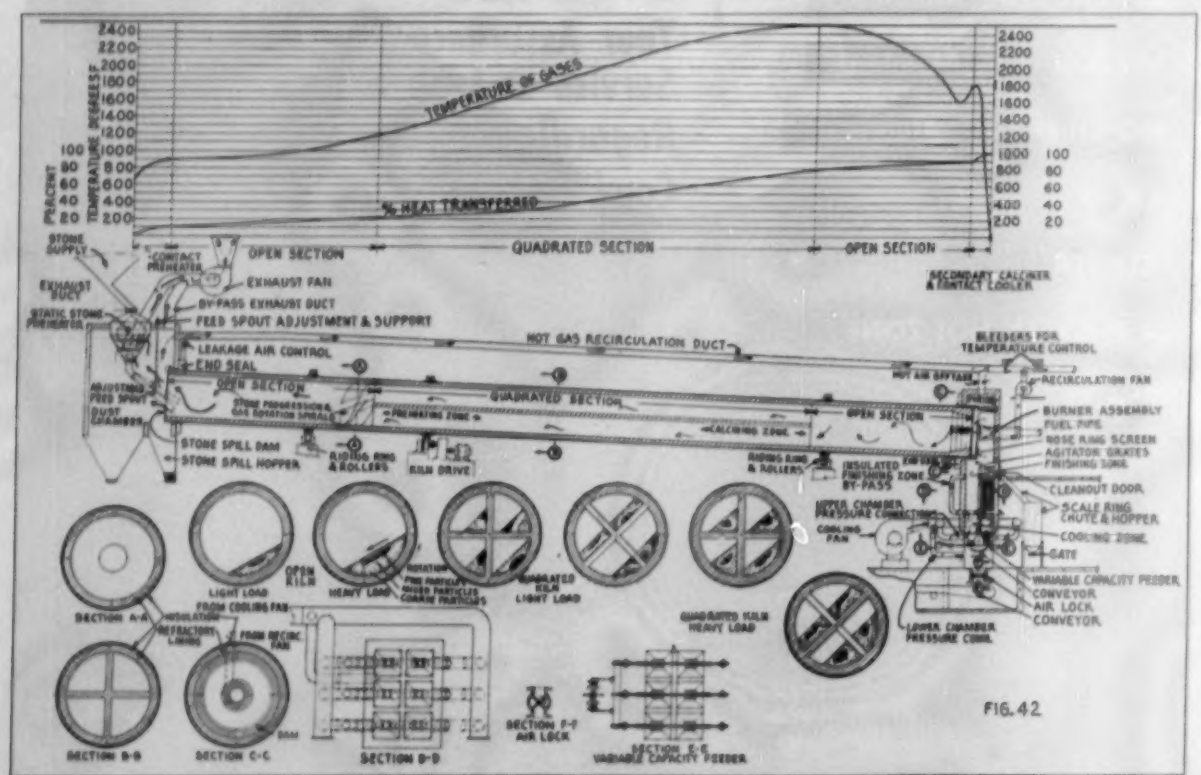


Fig. 42: Cross sections and elevation details of Azbe rationalized rotary kiln system

Why Oliver offers two tractors for the same kind of work

Pictured above is the Oliver Super 55 wheel tractor. Below, the "OC-3" crawler. Both do the same kind of work. Both have mounted equipment that includes: front-end loaders, bulldozers, angling-blade and hydraulic 3-point hitch that takes scrapers, booms, forks, scoops, post diggers and many other tools.

Together these two tractors can produce far more than a single larger crawler or wheel tractor. Put a loader on one, bulldozer on the other and you have a team for any job. A 3-point hitch on each tractor makes equipment twice as useful, half as expensive—buy one tool, use it on either machine. This interchange even includes an all-hydraulic ⅜-yd. backhoe.

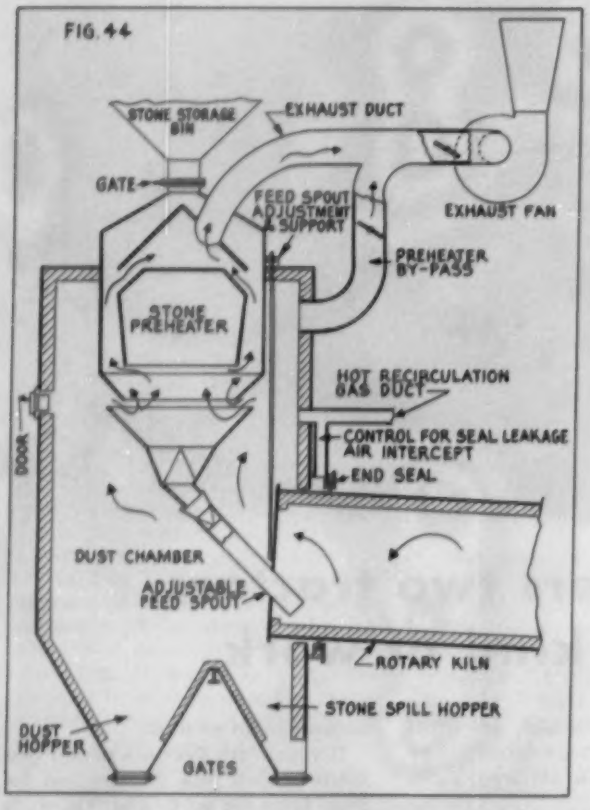
These tractors are compact and easy to handle. They get around fast, work in small quarters, take little fuel and can be used in *two* places at one time! And when half this team is a crawler, your work continues year around, in all weather.

If your work does not permit two tractors, then pick the one that fits best, saves the most. The "OC-3" is gasoline powered, the Super 55 offers gas or diesel power. If you want to see these tractors and drive them yourself, or learn about the many mounted tools they use, call or see your Oliver Industrial Distributor.

THE OLIVER CORPORATION
400 W. Madison Street, Chicago 6, Illinois

OLIVER

A complete line of industrial wheel and crawler tractors



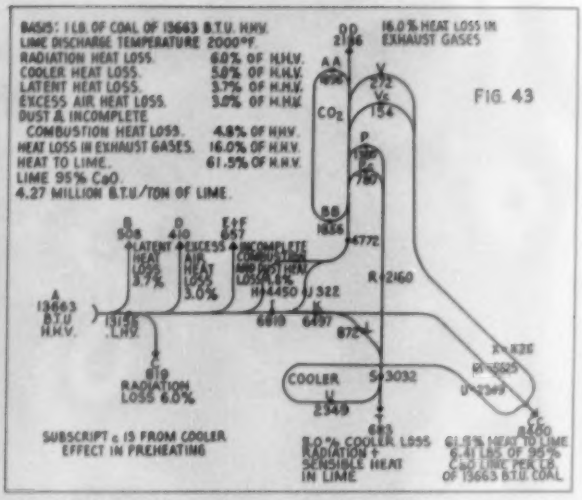

BASIS: 1 LB. OF COAL OF 13663 B.T.U. H.H.V.
LIME DISCHARGE TEMPERATURE 2000°F.
RADIATION HEAT LOSS. 6.0% OF H.H.V.
COOLER HEAT LOSS. 5.0% OF H.H.V.
LATENT HEAT LOSS. 3.7% OF H.H.V.
EXCESS AIR HEAT LOSS. 3.0% OF H.H.V.
DUST & INCOMPLETE COMBUSTION HEAT LOSS. 4.8% OF H.H.V.
HEAT LOSS IN EXHAUST GASES. 16.0% OF H.H.V.
HEAT TO LIME. 61.5% OF H.H.V.
LIME 95% CaO.
4.27 MILLION B.T.U./TON OF LIME.
16.0% HEAT LOSS IN EXHAUST GASES
FIG. 43
SUBSCRIPT c IS FROM COOLER. EFFECT IN PREHEATING
5.0% COOLER LOSS. RADIATION + SENSIBLE HEAT IN LIME
61.5% HEAT TO LIME 6.41 LBS. OF 95% CaO LIME PER LB. OF 13663 B.T.U. COAL

Fig. 43: Heat balance of a practical, high efficiency rotary kiln

Fig. 44: A version of counterflow rotary kiln preheater

Other illustrations will show these improvements.

The new Azbe kiln does not have these disadvantages. Why? Because of these main features in the system:

1. The rotary kiln is short and compact and of high capacity. From 20 to 25 cu. ft. of internal volume is all that's required per ton of output. For 240 tons output, a kiln no larger than 8- x 210-ft. size is sufficient. A 5- x 80-ft. kiln will produce 75 tons. This great reduction in size over kilns commonly used is made possible to large degree by greatly increased internal heat absorption area. It also results from handling residual calcination and terminal cooling of gases outside of the rotary portion of the system by arrangements lending themselves better to the purpose than the rotary portion presents.

2. Its thermal efficiency is high. In this installation the thermal efficiency is about 60 percent — requiring no more than 4.5 million B.t.u. per ton of high calcium lime. Distribution of the remaining heat losses is indicated by Fig. 43 and the heat balance below:

Losses due to	Percent
Products of combustion at 750 deg. F.	13
Escaping CO_2 from stone	8
H_2O from combustion of hydrogen	8.5
Excess air or incomplete combustion	3
Hot lime and lime cooler radiation	8
Kiln radiation	6
Miscellaneous and unaccountable	6
	61.5

3. The kiln waste gas temperature is low. It comes within 50 deg. F. of the theoretical temperature corresponding to the thermal efficiency. This is made possible by arrangements which reduce delayed combustion, increase heat transfer area and heat transfer rate in the calcining zone of the kiln, and reduce the calcining zone terminal temperature differential. It is also due to the increased stone flow through the preheating zone, and to rapid terminal cooling when the escaping gases are brought for a very short period into direct contact with the entering stone.

4. It has efficient terminal cooling. The arrangements which accomplish terminal cooling tend to some extent to filter the gases, reducing the loss to the dust chamber and the stack and returning it to the kiln. This is shown in the original illustration, Fig. 42, and improved in Fig. 44. To retain the temperature of the gases at the maximum, a special kiln seal ring is provided as illustrated in Fig. 45. This also assures an exhaust of high CO_2 concentration for process use.

5. More efficient calcination is achieved. The kiln is equipped with a stationary sectionalized and pressurized chamber of dual purpose where the conventional lime cooler usually is located. The upper part of this is the finishing zone. Lime is discharged from the kiln with a portion completely burned and very hot, a part of the charge which calcines most readily in the rotary. A portion more resistant to calcination, requiring a longer time, also is discharged. The sensible heat of the completely burned portion is transferred to the incompletely burned, accomplishing full calcination. Some air is allowed to pass through this upper chamber to reduce CO_2 tension, and therefore the required calcination temperature, which then continues down to 1300 deg. F. Much lime may be after-calcined, ordinarily requiring 20 percent of the terminal kiln length. Even if it contained no more than two or three percent in CaO, the advantage

(Continued on page 74)

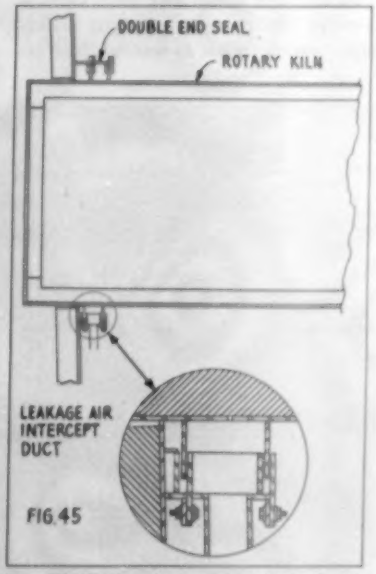


Fig. 45: Feed end of rotary kiln seal with leakage air intercept

HOW TO BUY RUBBER HOSE

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and get "More Use per Dollar"

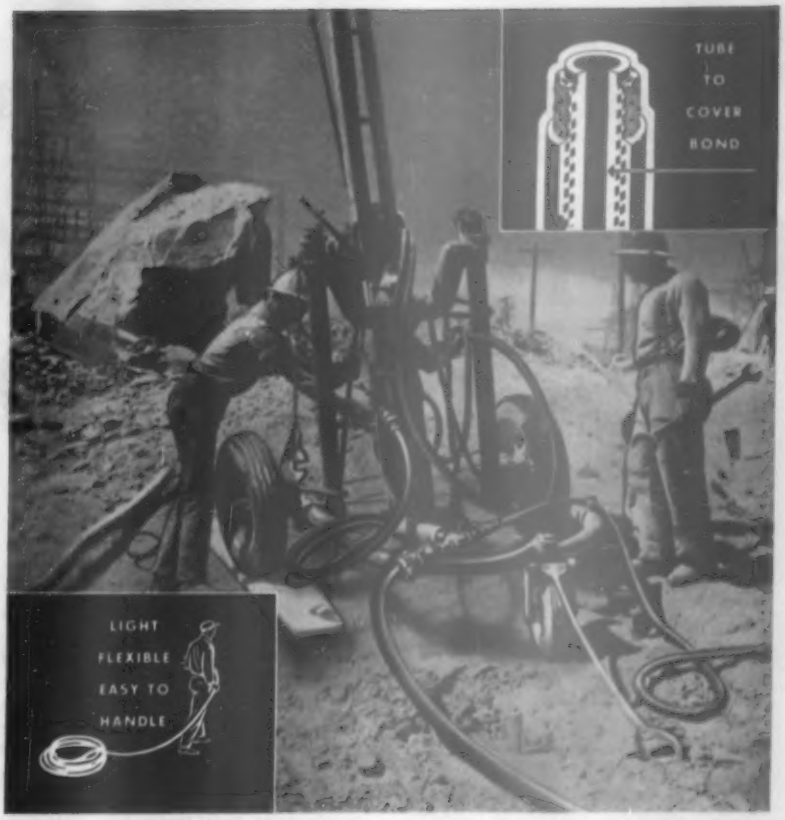
Select a light weight hose construction that is flexible and kink resistant for long-life dependability.

Hose that is light in weight—yet strong enough to safely withstand high pressures—is easier to handle. Men like it better and do more work with it. Look for a hose that is light, yet strong, for ease of handling.

If the hose you buy resists kinking you are assured maximum flow under all operating conditions. Hose that is mandrel-made, rather than molded in a pre-set coil, will coil and uncoil freely in any direction . . . eliminate points of strain at kinking points that can cause costly internal damage and rupture.

Make certain the hose is engineered for maximum flexibility . . . from tube to cover. Tube-to-cover flexibility prevents separation of cover, tube or strength member plies . . . reduces hose costs by increasing hose life.

Specify the one hose that gives you all these features . . . specify R/M Homoflex Hose.



HOMOFLEX HOSE

The unique construction of Homoflex Hose makes it easier to handle because it is light, has no pre-set twist . . . coils and uncoils easily without kinking. All unneeded bulk has been engineered out. An exclusive process creates a homogeneous cover, strength member and tube that are virtually inseparable to produce a hose construction that is extremely flexible, yet rugged and strong. Homoflex Hose does a better job under tough conditions . . . and it lasts longer. Inside and outside diameters are uniform.

Ask your R/M representative about types of Homoflex Hose for your operations. He can also tell you why other types of R/M Hose for general and special purposes last longer, too . . . give you "More Use per Dollar".

R/M

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

still would be very great as complete terminal calcination in the case of most kilns is virtually impossible. These upper sections of the various chambers constitute a "finishing zone," completing the calcination and only partially cooling the lime, through the use of sensible heat for calcination and through very limited passage of air intended to reduce the CO_2 tension and also to prevent recarbonation.

6. Sensible heat recovery is high. The lower portions of the various sections of the above chamber constitute the "recuperative lime cooler," through which a sufficiently large amount of air passes under pressure, to completely cool the lime. Most of this air, on the way to the kiln, by-passes the upper finishing portion of the sections. The aim is to keep the lime hot as long as possible to complete residual calcination. The cooling is fully recuperative. Virtually all heat is regained, since wall surface exposed is not only limited, but is of substantial thickness, and insulated. This almost complete recovery of the sensible heat of the lime is the most important of the several factors contributing to the kiln's exceptional performance. Fig. 46 shows an alternate design of the cooler finishing zone, combined.

7. It has a low temperature peak. In ordinary kilns, maximum temperatures are usually exceedingly high, up to 3000 deg. F. and more. This is because heat is generated at a rate faster than it is absorbed. In the new Azbe kiln, the aim is not to achieve complete calcination within the rotary section. In addition, heat absorption surface through refractory insertion in the hotter portion of the Azbe kiln is something like three times as great, amounting in total effectiveness to four or five times that of an ordinary open rotary kiln section.

In view of this, and since peak temperature is not greater than 2500 deg. F., refractory, scale adhesions and ring problems are unlikely to occur.

8. Complete insulation is possible in a kiln operating at such a low temperature, and without danger of refractory failure. This insulation, combined with the compactness of the unit and the fact that internal temperatures are not excessive, reduces the ordinarily serious radiation loss to the rather low figure of 5 percent.

9. Wide range of stone size is permitted by these conditions, which tend to destroy the sliding action and size segregations and bring the smaller fractions of the stone repeatedly to the heat conferring flame, or to hot wall surfaces. The kiln is therefore not critical in its stone size acceptance, permitting a wide range in the feed size, perhaps the entire unscreened crusher discharge, without reducing capacity or causing poor quality.

10. As a further improvement, the system of hot gas recirculation is introduced. Returning waste gases as hot as obtainable, their use in the kiln, and operation at much higher temperatures due to presence of CO_2 and the use of some of the recirculating gases for fuel injection, flame projection and distribution control, all contribute to higher thermal efficiency and improved capacity.

The net result of these various improvements is a kiln that is expected to assure utmost conservation of heat, highest capacity, and attainment of the best lime.

Rocky's Notes

(Continued from page 24)

whereby new minerals and rocks are formed." Thus, as cement and concrete researchers are well aware, when alkali is introduced into concrete with a certain kind of physico-chemical environment, the resulting metamorphism is disastrous to the concrete. If we would make concrete more durable we must study how it will react to the particular environment in which it will be placed, and find ways to promote such subsequent changes in its composition as will make for durability rather than destruction.

The final chapters of the book deal with mineral resources, and there are paragraphs on crushed stone, sand and gravel, limestone, gypsum, etc. — enough to prove that our authors had "economic geology" in mind as well as descriptive geology. An appendix entitled "Maps, Topographic and Structural," tells how to read geological survey maps and sections. A second appendix explains the usual map symbols, columnar sections, and structure sections.

From the outline of the contents we have given above, we trust we have made clear that this textbook is not only interestingly written and arranged, but really contains much practical information of value to the producer and prospective producer of rock products.

$204 Billion Ten-Year Need for Non-Federal Construction

DEPARTMENT OF COMMERCE, in its May issue of Construction Review, has published an article which brings together recent estimates of various groups and agencies regarding volume of need for non-federal public construction (includes highways, schools, hospitals, water and sewer facilities, and other state and local public works) during the ten years ending 1965. This estimated need totals $204 billion, or approximately $20 billion annually.

When compared to construction put in place for these same type projects during 1954 of $8.6 billion (a record amount), these estimates indicate a very encouraging future for construction. Expressed in terms of 1954 construction costs, this huge requirement is equivalent to nearly four times the amount of non-federal public works construction put in place during the past ten years, and one-third more than total construction volume for these types in the past 35 years.

The report points out that the current deficit in public works has occurred in spite of an unprecedented volume of this type of construction during the first half of the 1950's.

The estimates, which are based primarily on official population proportions, are shown in the following table, along with the 1954 figures. Estimates were made by the Public Health Service and the Office of Education of the U. S. Department of Health, and by the Bureau of Public Roads and Business and Defense Services Administration of the U. S. Department of Commerce.

Type of Construction	Value of new construction (in billions of 1954 dollars)		
	Required during 1955-64		1954
	Total	Annual Average	Total
Highways	92.0	9.20	3.458
Education buildings	41.5	4.15	2.616
Hospital/institutional buildings	22.0	2.20	0.653
Water and sewerage works	25.5	2.53	1.029
Other non-federal public works	23.2	2.32	0.880
All types	204.0	20.4	8.636

First-Aid Contest

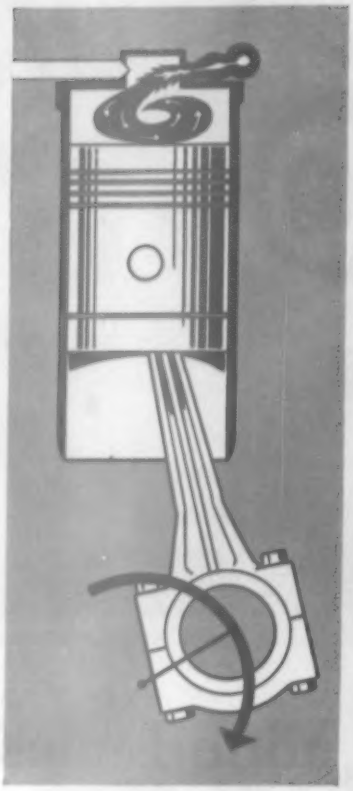
THE NATIONAL FIRST-AID AND MINE RESCUE CONTEST, also known as "World Series of Safety," will be held at Knoxville, Tenn., October 10, 11, and 12, 1955. The contest is open to first-aid and mine-rescue teams from the ore-mining, quarrying, and oil and gas sectors of the mineral industries. Details are available from C. H. Dodge, Subdistrict Health and Safety Supervisor, Subdistrict D, U. S. Bureau of Mines, Jellico, Tenn.

"Processing of Perlite"

CALIFORNIA JOURNAL OF MINES AND GEOLOGY, in its April 1955, issue, features an article entitled "Processing of Perlite," by H. A. Stein and J. B. Murdock, of the Perlite Corporation, Chester, Penn. The article outlines the requirements for efficient functioning of a perlite plant and describes three types of perlite furnaces.

The New Allis-Chalmers Power Unit Line Delivers

LOWER COST POWER



Allis-Chalmers diesel power units provide a new kind of engine performance and extra-long life. Heart of this outstanding performance is a unique *follow-through* combustion. Here's how it works —

A blast from the energy cell (see drawing), thoroughly mixes air and fuel for complete burning in the combustion chamber. This results in peak efficiency, lower cylinder temperatures for more complete lubrication of walls, longer life for pistons and rings.

In addition, Allis-Chalmers power units are designed with seven main bearings, rigid blocks, removable "wet" cylinder sleeves, removable valve guides, full-length water jackets, full-pressure lubrication — all contributing to dependable, continuous, long life performance.

Ask your Allis-Chalmers dealer for the visual story revealing the full advantages of these engines.

Five sizes of Allis-Chalmers diesel power units — ranging from 15 to 197 brake hp — are available as open style or complete self-contained units. They are compact and easily installed.

Illustrated: Model D-779

6-cylinder diesel

140 brake hp at 1400 rpm

779 cu in. displacement

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

New tunnel starts downward spiral deep in the quarry at a point approximately right of center of picture

Mine Limestone 1500 ft. Underground for Cement Manufacture

• Riverside Cement Co., will use large shovels in the mine and high capacity trucks for haulage of stone to the Crestmore, Calif. plant on a 10 percent grade

By HUBERT C. PERSONS

LARGE CAPACITY TRUCKS AND POWER SHOVELS of the type ordinarily used in open pit quarries are to be operated 1200 to 1500 ft. underground in an unusual limestone mine to be opened soon by the Riverside Cement Co. The mine is at the Crestmore plant, four miles northwest of Riverside, Calif. The Crestmore plant is one of the oldest cement mills in the country, having been started in 1909. Limestone at that time was quarried and loaded by hand and then hauled to the primary crusher in mule-drawn wagons. Then came steam shovels on rails and cars in a train pulled from quarry to crusher by a small locomotive.

Beginning about 1927 an underground limestone mine was opened and stone was mined by the block caving system. Operation of the surface quarry with modern equipment was also continued. Gradually, however, all the rock was extracted from the original mine workings. This original system is no longer the most economic for mining the deposit, and was discontinued in February, 1954—all limestone being supplied from quarries several miles from the cement plant.

New Limestone Deposits

It was known that other limestone deposits existed on the Crestmore property but their extent and the characteristics of the limestone were known only roughly. So in order to learn the exact geological and chemical characteristics of the deposits, extensive exploratory boring with diamond drills was undertaken. It was found that there are two limestone beds in the Crestmore deposit, each bed approximately 2500 ft. long and 200 to 300 ft. thick, dipping approximately 45 deg. at the surface and tend-

SMALL QUARRIES AND MINES IMPROVE THEIR PROFIT PICTURE WITH "EUCS"

fewer drivers . . . lower fuel cost . . . reduced maintenance

When your competitors are using "Eucs" to haul stone, sand or gravel, you've really got a problem on your hands! You just can't afford to pass up the cost cutting advantages . . . the high production and low maintenance cost . . . that you get with "Eucs".

And your operation doesn't have to be a big tonnage producer for "Eucs" to pay off. For example, H & R Stone Co. of Indiana is just one of many small quarries, sand and gravel producers, and open pit mines that have cut their hauling costs with Model UD 10-ton Rear Dumps. This quarry replaced four conventional highway trucks with a single 10-ton "Euc" and reports savings of $6000 per year in maintenance cost alone. Because the "Euc" stays on the job with none of the lost time that was a costly headache previously, there have been important savings in labor cost, too.

Have your nearby Euclid Distributor provide a production and cost estimate for your operation . . . there's no obligation and the chances are mighty good that he can show the way to better profits through lower hauling costs.

10-ton off-highway "Euc"

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

Howard R. Starke, director of engineering, on an inspection tour

ing to flatten out to approximately 30 deg. at depth. These beds are separated by several hundred feet of grano-diorite. The limestone is described as a crystalline, metamorphosed rock containing varying but small amounts of magnesium hydroxide.

Cores Are Photographed

A Tro-Pari bore hole surveying instrument was used for a careful survey of all diamond drill holes. All cores were photographed and enlargements made on a scale of 2 in. to 1 ft. in order to have a record of fractures and other planes of weakness. Chemical analysis was also made of each core.

The drilling and pumping tests also established the fact that the water table in the lower limestone bed could be maintained at a level which would not interfere with mining operations, and without affecting the water table in the upper bed.

With these data in hand, L. C. Smull, vice-president, Howard R. Starke, vice-president and technical director and R. H. Wightman, superintendent of mines and quarries of Riverside Cement Co. were ready to study the experimental oil shale mining operation being conducted by the U. S. Bureau of Mines at Rifle, Colo. A number of other comparable mining operations were also visited to study methods and examine the latest type of equipment being used.

Room and Pillar System

Information secured during these visits together with the drilling data and experience with the original mine, led to the belief that large openings and heavy equipment could be used to advantage in the Crestmore deposits.

The services of Philip B. Bucky, professor of mining, Columbia University, were retained to test the Crestmore rock and report on the advisability of utilizing a room and pillar system of mining. His favorable report coincided with the opinions of E. D. Gardner, chief engineer of the U. S. Bureau of Mines, and Emery Sipprelle, general superintendent of mining for the Mississippi Limestone Co.

Technical assistance toward solution of the water problems encountered was given by W. P. Rowe, consulting hydraulic engineer retained by the company for many years.

Spiral Road Started

Work is now underway on a spiral road 30 ft. wide and 20 ft. headroom, entering the new underground workings on a 10 percent grade starting at the lowest point in the quarry.

An air-operated, self-propelled two-machine Rogers jumbo drill is being used for drilling in the 20- x 30-ft. tunnel. Rock from the tunnel will be loaded with a 1¼-cu. yd. 43-M Marion shovel into 18-ton LeTourneau diesel, scrubber-equipped Tournarockers, and hauled to the crusher.

Even larger equipment, including 3-cu. yd. 93-M Marion shovels, will be used when rooms 60 ft. wide and 30 ft. high are driven from the tunnel. Cutting of these rooms will be done with four-machine jumbo drills. Two additional cuts of 30 ft. each from each room are proposed. A rotary-type drill will be used to drill vertical blast holes as in conventional quarry operations, in these two additional cuts. Rock from the rooms will be removed to the crushers by means of 30-ton Kenworth electric-powered trolley trucks.

R. H. Wightman, superintendent of mining, inspects some of the old mine workings now being abandoned

To increase the percentage of stone which can be taken out, openings will be cut through the pillars between the rooms. Between each group of three cuts a horizontal pillar will be left. This procedure will finally leave rooms 60 ft. wide and 90 ft. high the full width of the deposit.

During cutting of the tunnel three 50,000 c.f.m. Joy axial flow fans will provide ventilation. As the drilling progresses the tunnel will be connected with the ventilation shaft of the old mine. This will also afford an additional exit from the new mine.

Two Scale Models Built

The execution of the plan required a substantial appropriation of money. Therefore it was decided to build scale models demonstrating the entire operation so that the plan might be more easily visualized by members of the company's Board of Directors.

One model was made from clear plastic scaled 100 ft. to the in. This model represented an area 2500 x 3200 ft. and a depth of 1500 ft. underground. Transparent fluorescent lacquers were applied to parts of the model to emphasize the various features; such as, the diamond drill holes, upper and lower limestone beds and water table. Important features of the proposed operation could be brought out by viewing the model under ordinary bright light or ultra-violet light.

Plastic foam material was used to construct the other model on a scale of 20 ft. to the in. This model was intended as an aid in developing and explaining the general method to be followed in the mining operation.

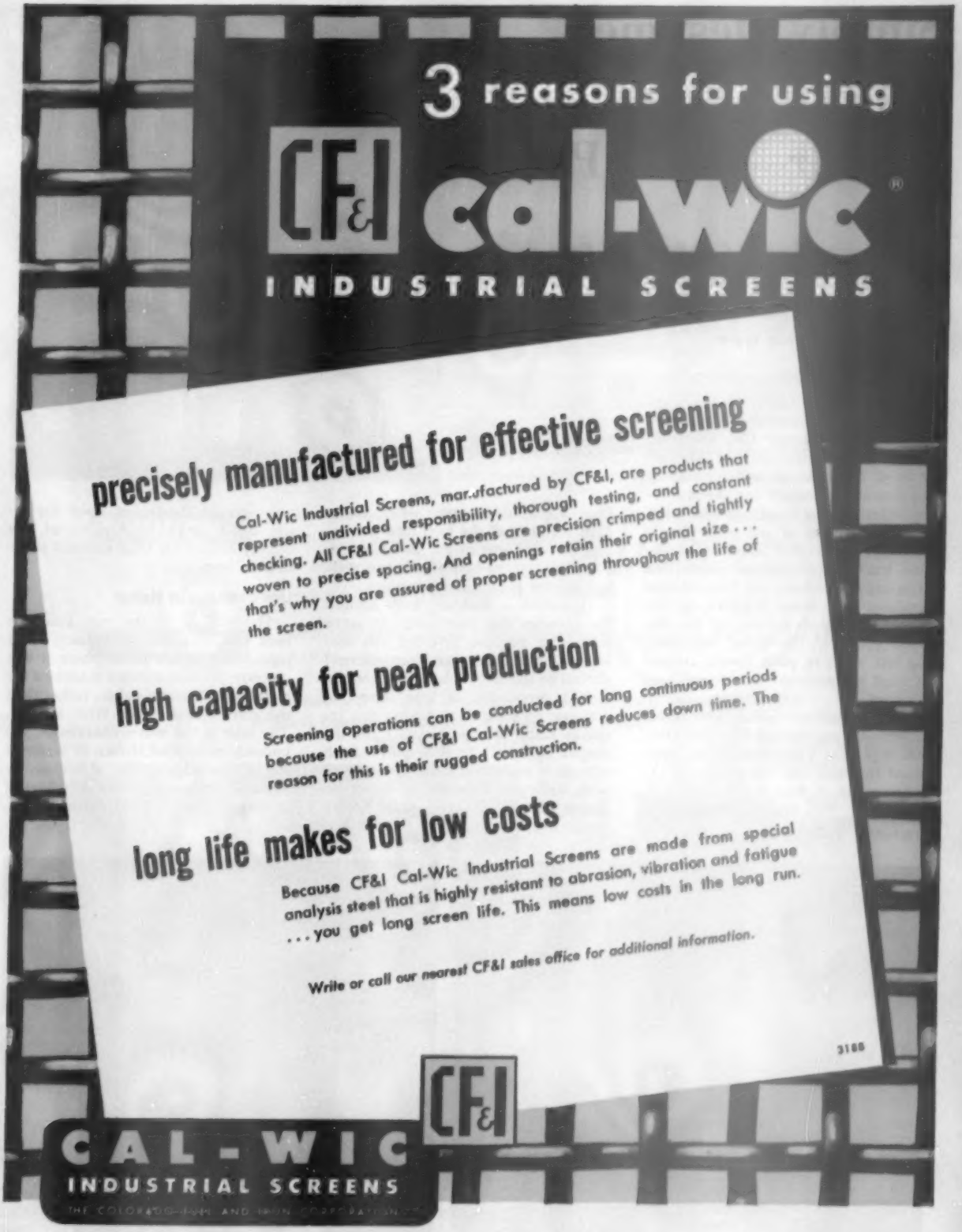
The model was built in three pieces so that it could be taken apart to show the access tunnel, partial completion of the first cut and the beginning of a second level.

California Cement Outlook

THE CEMENT OUTLOOK in northern California during the next several years looks "good but competitive," according to Arthur Kroeger, professor of marketing, Stanford School of Business, who spoke at a Calaveras Cement Co. general sales meeting recently. He also said northern California is lagging behind other parts of the country in utilization of construction techniques involving pre-stress, precast, tilt-up, lift-slab and "blown" systems of concrete application.

Purchases Indiana Gravel Firm

STANDARD MATERIALS CORP., Indianapolis, Ind., recently acquired the assets of the Terre Haute Gravel Co., Terre Haute, Ind. Involved in the transfer were 650 acres of land and plant equipment.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CF&I cal-wic®
INDUSTRIAL SCREENS
precisely manufactured for effective screening
Cal-Wic Industrial Screens, manufactured by CF&I, are products that represent undivided responsibility, thorough testing, and constant checking. All CF&I Cal-Wic Screens are precision crimped and tightly woven to precise spacing. And openings retain their original size . . . that's why you are assured of proper screening throughout the life of the screen.
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Screening operations can be conducted for long continuous periods because the use of CF&I Cal-Wic Screens reduces down time. The reason for this is their rugged construction.
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Canadian Representatives at: Calgary • Edmonton • Montreal • Vancouver

Simply Designed Efficient Lime Mortar—Putty Plant

• Masons Supply Co., Portland, Ore., designed plant for push-button control and the use of continuous type lime slaker instead of batch type

Exterior view of lime mortar-putty plant

PLACED IN OPERATION recently by the Masons Supply Co., Portland, Ore., for the production of Masco* certified lime mortar and lime putty for mason contractors and the plastering industry, is a simply designed, but efficient lime mortar and putty plant.

Every conceivable labor saving device has been employed, from the dumping of the bulk raw lime covered gondolas into track hoppers, to the final mixing and loading of the finished product. The plant represents the last word in push button control of what has generally been considered a rather complicated process.

Plant design was handled by James G. Pierson, engineer of Portland, Ore., but in it was incorporated the combined research and thinking of D. V. Jennings, H. A. Van Patten and O. T. Coffelt of the Masons Supply Co.

*Trademark

Over a period of some seven years, each member of the firm took advantage of every opportunity in the course of his travels, to investigate outstanding mortar plants and processes.

Operation is basically built around the premise that lime putty, to serve its proper purpose in either the masonry trade or the plastering industry, should be thoroughly aged and contain a high proportion of lime solids. In addition to controlled slaking this requires ample storage capacity for the proper aging of the lime putty. Such storage is provided by three wood bins with sufficient capacity to insure an ample supply of aged putty at all times. It was felt by the producers that only through the use of wood for aging tanks could lime putty of the quality desired for their certified products be obtained.

Use Continuous Slaker

The slaking of the raw lime has been simplified and streamlined but it represents the one point where it was not possible to substitute machines for men. A continuous slaker, rather than the conventional batch type, is used. The lime is fed into a continuous, accurately controlled stream of water at the intake of the slaker—continuously agitated by an ingenious mechanical device — and pumped from the dis-

(Continued on page 116)

Left: Three of the large wood aging vats. **Right:** Slaker, slaker hopper, dry lime storage agitator and lime slurry pump

How to get

UNIFORM PERFORMANCE

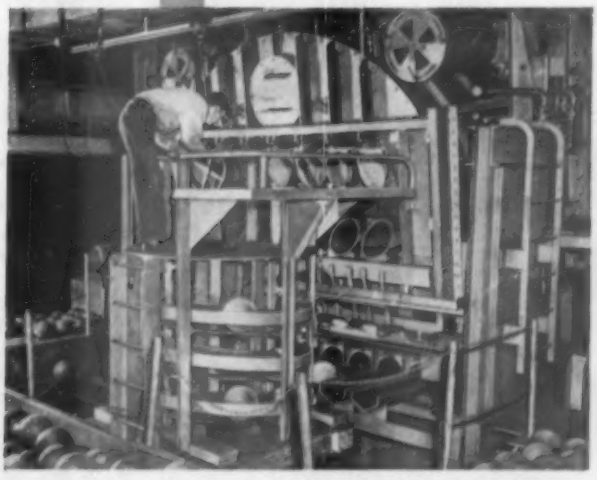
in Rotary Kiln-Firing Service

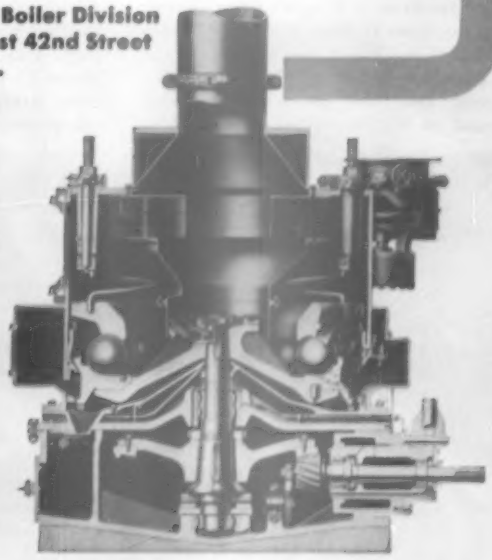
PROBLEM— To get consistent delivery of coal of uniform fineness to burners, at closely controlled, constant rates, even after years of operation in kiln-firing service.

SOLUTION— The use of long-life, wear-resistant parts, such as the grinding balls of B&W Type EL Pulverizers, which are forged of specially selected steels and are then scientifically heat-treated in furnaces like the one shown. Finished balls also are held to close spherical tolerances.

RESULT— Sustained rated output within close limits throughout the long life of the ball-bearing grinding elements.

The Babcock & Wilcox Company, Boiler Division
Process Equipment Dept., 161 East 42nd Street
New York 17, N. Y.





BABCOCK & WILCOX

C-207

Two views of the dock facilities at Wright's Cove across the bay from Halifax. Left: The 200,000-ton capacity stockpile served by a shuttle belt conveyor. Right: Boat loader shuttle-belt conveyor discharging gypsum into the cargo hold. Capacity is 4000 t.p.h.

National Gypsum Starts Halifax Plant

NATIONAL GYPSUM CO.'s new $6 million gypsum operation near Halifax, Nova Scotia, which will supply raw gypsum for the company's Atlantic seaboard plants, was unveiled for the press on July 16, about three weeks following its first ocean shipment. The operation consists of a quarry and crushing plant at Milford, some 40 mi. northeast of Halifax, and dock facilities at Wright's Cove, across the bay from Halifax; a 31-mi. rail line connects the two units. Shipments are expected to total 2,000,000 tons annually and will be made the year round to National's gypsum products plants at Portsmouth, N. H., New York City, Savannah, and Baltimore, and the yet-uncompleted plants near Burlington, N. J., and New Orleans.

The quarry at Milford taps the largest gypsum deposit in North America, with proven reserves exceeding 200,000,000 tons. The company, owning 1000 acres of the gypsum-rich land, is presently developing an area of 140 acres as the optimum quarry site. The overburden of this quarry block varies from 4 to 50 ft.—with an average of about 25 ft. Thus far, 15 acres have been cleared of about 1,000,000 cu. yd. of overburden. The bottom of the primary crusher is located 155 ft. below the original ground surface. To clear the entire 140 acres of the quarry block, about 7,000,000 cu. yd. of material will be removed.

Two major railroad cuts were required to give favorable grades and to avoid covering minable gypsum. The cuts are more than 1000 ft. long and 35 to 50 ft. deep. A railroad bridge, 270 ft. long and with a 100 ft. clear center span, was built to cross the Shuhenacadie River. An office and warehouse building with a total of more than 5500 sq. ft. of floor space was built, as was a service building, machine shop, engine shop and grease service and storage building.

The 70-ft. quarry face is broken by drilling and blasting, and gypsum is loaded by 2½-cu. yd. Northwest diesel shovels into 22-ton Euclid trucks which carry the rock to the primary crusher. A 6-ft. pan feeder delivers the material to a 36- x 72-in. "slugger roll" crusher, producing 1200 t.p.h.

From the crusher, an inclined belt conveyor elevates the gypsum 150 ft. to the top of the secondary crusher building where it is screened, with the oversize going to a secondary crusher. Another inclined belt conveyor transfers the finished product to a 10,000-ton stockpile. Recovery is through a tunnel belt conveyor which leads to a shuttle belt conveyor at the rail car loading building. Between 70 and 75 cars are loaded daily and transferred in two runs via Canadian National Railway to the dock.

At the 150-acre dock site at Wright's Cove, the gypsum is unloaded into a hopper by means of a rotary car

(Continued on page 114)

Quarry scene at Milford, showing 2½-cu. yd. shovels loading 22-ton heavy duty trucks

MORE TONNAGE

...at less cost!

Low Voltage Resistance Heating Prevents Moist Materials From Adhering to Screen Cloth

By keeping screen cloth clear, the *Thermo-Deck* heating unit increases capacity in two ways . . .

1. Screening efficiency is improved on a clean deck.
2. Converts downtime into production time by eliminating the need for manual cleaning of cloth.

Increases Cloth Life, Too— With a *Thermo-Deck* unit on the job, screen cloths last as much as three times longer than unheated screens. Because blinding is eliminated, the necessity for destructive pounding, brushing and flame heating is also eliminated.

Thermo-Deck units may be used on all vibrating screens handling fine moist material. Installations can be made on single-deck screens or on any deck of a multiple-deck unit.

A-4651

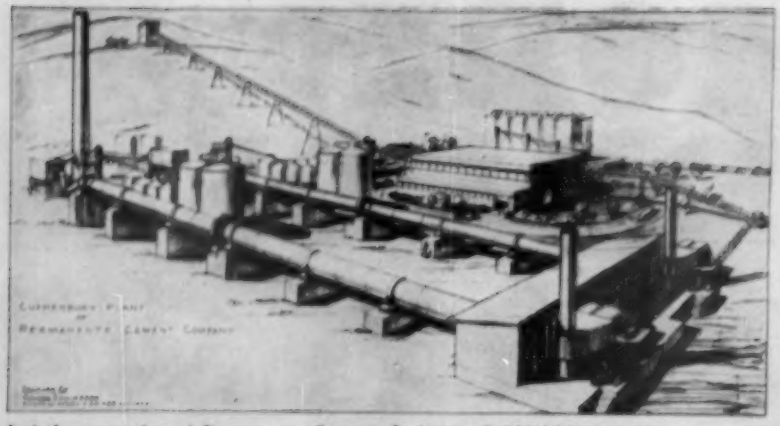
For Intermittent Feed, use *Sta-Kleen* Deck with Heating Unit

The use of a *Sta-Kleen* deck prevents fine materials from baking on screen during interruptions in feed. Rubber balls bouncing between the screen cloth and a retaining deck impart a dislodging vibration.

For complete information on the THERMO-DECK *heating unit, see your A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 07B7812A.*

Thermo-Deck and Sta-Kleen are Allis-Chalmers trademarks.

ALLIS-CHALMERS



Artist's conception of Permanente Cement Co.'s new 2,000,000-bbl. cement plant in southern California

New California Cement Plant

PERMANENTE CEMENT CO., Oakland, Calif., will construct a new $12,000,000 cement plant near Lucerne Valley, Calif., according to Henry J. Kaiser, chairman of the board and president. The company has filed a location and development plan with the San Bernardino County Planning Commission, preliminary to obtaining a building permit.

It will have an initial annual capacity of 2,000,000 bbl., and is scheduled to begin production in the early fall of 1956 with a permanent labor force of about 175, and an annual payroll of nearly $1,000,000. Construction is expected to begin shortly. Bids will be invited as soon as engineering is completed by Kaiser Engineers Division of Henry J. Kaiser Co., which is designing the facilities and will supervise construction.

The plant and adjacent limestone quarry will be located in the Cushenbury area, approximately 30 miles southeast of Victorville. A 32-mile railroad will be built to connect the plant with the main rail line at a point near Hesperia, Calif.

Wallace A. Marsh, vice-president and general sales manager, Permanente Cement Co.

Construction Outlook

CONSTRUCTION PROSPECTS for 1955 continue high, according to a report from the Labor and Commerce departments, which raised their estimate of construction spending in 1955 to $41.8 billion. This figure is $4.2 billion above the previous high in 1954, and is higher than had previously seemed likely. In November, 1954, the two agencies had forecast such outlays in 1955 at $39.5 billion. According to the departments, the estimate has been raised due to "the unprecedented volume of construction activity so far this year, and indications that there will be virtually no abatement in the present rate during the remainder of 1955."

Giant-Size Safety Banner

NATIONAL SAFETY COUNCIL has added a giant-size accident prevention banner to its stable of safety training aids. The banners, 10 ft. by 3½ ft. and printed in two brilliant colors, point up practical safety slogans with attention-getting drawings. The banners come in two styles—one for indoor and the other for outdoor display.

Twelve banners — one for each month of the year — are available on an annual subscription basis. For further information, write the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

•

DRAGON CEMENT CO., INC., New York, N. Y., declared a quarterly dividend of 40¢ on the company's $10 par value capital stock, payable June 17, 1955, to stockholders of record at the close of business June 7, 1955.

Handling Damp Material

(Continued from page 68)

from the quarry and eventually reduce (in a closed circuit) to the desired fineness. We know of no other type of machine which will do this with *damp* material, and we have studied the problem extensively.

The pan-mill will crush hard rock probably more effectively than soft, and extensive experiments in this field should be carried out by the manufacturers of the machines to ascertain the effective limits of their application. Bradley & Craven are producing a machine now fitted with two 7-ton rollers which we will be installing in a new agstone plant. Naturally the pan-mill needs a screen or classifier to extract the fines as they are made and the writer has had no experience whatsoever with thermo or electrically heated wire screens, but he has had many worries trying to screen damp materials.

Of necessity we developed a winnowing machine to separate out the fines from agstone and its performance is such that it may have an application for industries other than rock products.

Its operation is to take the feed (in our case 80 t.p.h.) and distribute it evenly to the edge of a rotating horizontal disc where the feed material drops a few inches in the form of a thin annular curtain. While the material is falling, it encounters a blast of low pressure air which passes through it and deflects the fines in the aggregate slightly (in our case about 1½ in. only). The fines then drop into an annular trough separate from another annular trough (coarse) where both fines and coarse are conveyed mechanically to where required and discharged.

The difference between this type of air-classifier and others is that the fine material is *drifted* by air not *conveyed* by air which not only saves enormously in power required for its operation, but obviates blocking chutes and tubes with fine damp material. It also will give a ⅛-in. separation with ease if required. The air classifier can be altered in a few moments to give the desired degree of fineness required and there are no screens, no hold-ups and no wear and tear or noise.

In operation we note the drying effect that the air has when it intimately associates itself with the finer particles. This suggests using the machine as a drying agent, but research is needed in this direction to ascertain its possibilities.

H. J. B. Topp
Gen. Mgr., Hatuma Lime Co. Ltd.
Waipukurau, New Zealand

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LOWEST PRICES! Many standard models of Dodge trucks are priced lower than all other makes! Yet with these low prices, quality-built Dodge trucks are dependable as ever.

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THE FORWARD LOOK! Now Dodge brings the Forward Look to trucks. New wrap-around windshield (biggest of any make!) means added visibility and safety! More reason why you should look at Dodge before you buy any truck. Why not phone your dependable Dodge truck dealer, today?

DODGE *"Job-Rated"* TRUCKS WITH THE *FORWARD* LOOK!

Down time is no joke. Say it happens when a clutch facing or a brake lining wears out.

If you replace with a Caterpillar-built part, here's what you're sure of: a friction part that's made of a material with high torque capacity but low friction loss, a long-wearing material that *really* resists glazing and chipping, a tough material that's been through rugged tests in the laboratory, on the proving ground, and out on actual jobs. In short, you're sure of *less* down time in the future.

If you replace with a substitute part—can you be sure of anything?

Better get genuine Caterpillar parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

These are genuine CAT® brake linings. They're made of a specially designed molded asbestos material. You can't buy better anywhere.

CATERPILLAR*

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INFORMATION

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below

1 **AIR POWERED TOOLS**—Ingersoll Rand Co. has announced a 52-page catalog, Form 5200-A, giving illustrations, specifications and a list of the equipment furnished with each type of "Air Impactool." On-the-job application photographs and case history studies are included, as well as descriptions and illustrations of air tools, Universal Electric Impactools, Multi-Cycle electric tools, etc.

2 **ANNUNCIATOR SYSTEMS** — Panalarm Products, Inc. has published Catalog 100 A, giving descriptions, illustrations, and mechanical and electrical design improvements of Universal "50" annunciator systems. Charts, engineering data and National Electric Code Requirements are given.

3 **AUGER DRILLS** — The Salem Tool Co. has published Bulletin M-105, describing horizontal truck-mounted and self-propelled McCarthy auger drills. Typical application photographs and advantages are given.

4 **AUTOMATIC VALVE POSITIONER** — Barber-Colman Co., Wheelco Instruments Div., has issued Bulletin F 5991-1, describing the Wheelco Throttitrol, an automatic valve positioner for use with a control instrument having a "high" and "low" contact with a neutral position.

5 **CHEMICALS HANDLING** — Sauerman Bros., Inc., has announced a booklet entitled "Chemicals-Handling and Storage," MMM No. 2, describing storage machines in use at a variety of installations. Layout drawings, photographs, data on basic chemicals and corrosion, etc. are included.

6 **CONCRETE BLOCK** — Besser Co. is publishing an external house organ, entitled, "Besser Block," featuring news of the concrete block industry, people in the industry, and hints about new and tried equipment for better block making.

7 **CONCRETE FORMS** — Irvington Form & Tank Corp. has issued a brochure showing the principal uses, features and new applications of Atlas Compo forms for concrete construction.

8 **CONTACTORS AND CONTROL RELAYS** — Allis-Chalmers Manufacturing Co. has released Bulletin 14B8171A, entitled "Heavy Duty d-c Contactors and Control Relays," describing contactors, including Type 522 units and control relays for heavy industry applications. Included is a parts interchangeability chart with a color code.

9 **CRAWLER TRACTOR**—The Oliver Corp. has published a bulletin describing and illustrating the Model OC-3 industrial crawler tractor. Included are detailed specifications, typical application photographs, parts illustrations, and allied equipment descriptions.

10 **CRUSHING-SCREENING PLANTS**—Diamond Iron Works has issued Catalog D-104, describing and illustrating "Rotor-Lift" portable crushing and screening plants. Typical application photographs and a material flow drawing are included.

11 **DIESEL ELECTRIC SETS** — Caterpillar Tractor Co. has brought out Form 31649, entitled "Modern Electric Power," describing the advantages of high capacity, small size diesel electric sets, matched to Caterpillar engines for maximum efficiency.

12 **DISSOLVED OXYGEN ANALYZER** — Arnold O. Beckman, Inc. has issued Bulletin 110-A, on the application of the Model 2B2B dissolved oxygen analyzer to modern steam generating plant operations. Basic principles of measurement, equipment required, and flow diagrams and descriptions of typical sampling systems are included.

13 **DRILLERS HANDBOOK** — Davey Compressor Co., Rock Drill Div., has published a 68-page, pocket-size booklet entitled "Drillers Handbook on Rock," giving a complete description of all common rocks, including hardness, texture, fracture and formation. It contains 71 illustrations, 15 charts, and a glossary of about 150 rock and mineral technical names and terms. Copies are available from the company at Kent, Ohio, for $1.50 each.

14 **DRILLS** — The Salem Tool Co. has published Bulletin M-100, describing the McCarthy vertical drill model 106-24 for strip mine operation, highway construction, soil engineering and general exploration. Field installation pictures and specifications are given.

15 **DRY FLUID DRIVE**—Dodge Manufacturing Co. has published Bulletin A-640, covering the Flexidyne dry fluid drive. Full color illustrations and cross-section engineering drawings of the drive with Taper-Lock sheave and Flexidyne coupling with Taper-Lock bushing are given. Dimensional drawings, prices and descriptions are also included.

16 **DUMP CARRIER**—Clark Equipment Co., Ross Carrier Div., has issued a brochure giving performance characteristics, construction details and engineering specifications of its Straddle dump carrier. The hydraulically operated dumping device is described, and container specifications are given.

17 **DUST COLLECTOR**—National Dust Collector Corp. has issued a 12-page bulletin giving specifications and descriptive details on the Hydro-Filter dust collector. Separating efficiencies, application data, construction and design as well as a description of models and capacity range available and a description of laboratory and test facilities are included.

18 **EARTHMOVER** — Caterpillar Tractor Co. has brought out Form DE514, entitled "DW21 Low Cost Earthmover." Contractors' reports on their experience with the "DW21" are included along with on-the-job illustrations.

19 **ELECTRIC HOISTS**—Harnischfeger Corp., P & H Hoist Division, has released three bulletins, Nos. H-37, H-38, and H-39, describing respectively the P & H Hevi-Lift special electric hoist, a heavy-duty unit for use in the medium-lifting range; the Zip-Lift special electric hoist, a rope-control wire-rope unit; and engineering information and specifications on the Zip-Lift electric hoist.

20 **ELECTRON MICROSCOPES**—Philips Co., Inc., has issued an eight-page booklet, entitled "Questions and Answers on Electron Microscopes." Shadow casting, use of the same instrument for electron diffraction, resolution, visual and camera work, etc. are explained.

21 **EXCAVATING AND MATERIALS HANDLING**—Marion Power Shovel Co. has brought out a 40-page bulletin, No. 403-C, on its complete line of excavating and materials handling machines. Photographs of each basic machine type and condensed specifications are given. A special section gives the history of the power shovel, and lists developments pioneered by the company.

22 **FEEDERS AND ROTARY VALVES**—Fuller Co. describes and illustrates its line of roll and vane-type feeders and rotary valves in Bulletin F-5. Dimension and capacity tables, drawings and lists of materials handled are included.

23 **FILTRATION**—Denver Equipment Co. has released Bulletin FG-B1, giving an analysis of filtration problems, and describing its disc filters, drum filters and laboratory filters. Drawings and specifications of machines and data about construction and operation are included.

24 **FLEXIBLE COUPLINGS** — Smith & Serrell, Inc. has released Bulletin 53, on flexible couplings, providing complete data for proper specification of the recommended coupling size for a range of motor drive from ½ hp. at 600 r.p.m. to 250 hp. at 3600 r.p.m. Dimensional drawings plus a table show characteristics of the 21 available sizes.

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25 **FLAME PHOTOMETER**—North American Philips Co., Inc., Research and Control Instruments Div., has announced a four-page folder giving design data on the Norelco Flame Photometer, Type 13130. Data is included on accuracy, sensitivity, operating conditions, maintenance, accessories, etc.

26 **GEARS** — Detroit Bevel Gear Co. has released an eight-page brochure on its complete gear and axle shaft lines, and illustrates and describes how gears are roll tested, matched and lapped, and sound tested for quiet, accurate operation.

27 **GENERATORS** — United States Motors Corp. has released two folders describing the entire line of diesel and gas-gasoline engine generators, including portable, mobile and stationary units for continuous and standby duty.

28 **HEAVY DUTY DUMP BODIES** — The Heil Co., Body and Hoist Sales Div., has released Bulletin BH-55107, giving construction features and detailed specifications of Models LH-11 and H-11 heavy duty dump bodies. Optional equipment is also listed.

29 **INDICATING PYROMETERS** — Barber-Colman Co., Wheelco Instruments Div., has announced Bulletin F 6048-1, describing and illustrating Wheelco indicating pyrometers. A combination indicating pyrometer and multi-position switch is also described, and specifications are given.

30 **INDUSTRIAL EQUIPMENT**—The Jeffrey Manufacturing Co. has issued a booklet, No. 888, listing its complete line of mining, material handling and processing equipment, as well as its facilities. Illustrations are included.

31 **INDUSTRIAL TRUCKS** — The Elwell-Parker Electric Co. has released a broadside outlining 24 cost-cutting ideas with industrial trucks from the major industries. Both standard type trucks and specially designed models are covered, and case examples are given.

32 **LIFT TRUCK**—The Hyster Co. has issued Form 1402, describing and illustrating the Monomast lift truck. Specifications, mechanical descriptions, operating advantages and dimensional drawings are included.

33 **LIFT TRUCKS**—Hyster Co. has released Forms 1406 and 1411, an industrial equipment analysis guide and a rating table for comparison and selection of fork lift trucks. The plan, known as "How to Select a Lift Truck," is based on user evaluation of job requirements and truck features by points with a chart and analysis guide.

34 **MOTOR**—U. S. Electrical Motors, Inc. has released a 12-page booklet, No. 1856, illustrating and describing the features of the Type H Uniclosed motor. Cutaway views point out various constructional features in full color.

35 **PALLET OIL** — Edick Laboratories, has issued a bulletin giving a description of No. 1727 pallet oil concentrate, as well as advantages, uses, directions for use, storage and packaging details.

36 **PLASTIC COATED WIRE ROPE** — Macwhyte Co. has issued Circular 5540, describing plastic coated cables of either preformed galvanized steel or stainless steel wire rope. Prices are also listed.

37 **PLASTIC FIRE BRICK**—Pilbrico Co. has published two catalogs, No. 67, giving product characteristics and typical applications, and No. 68, covering Standard, Super, Super A1, Super "P" and Air-Bonds. Illustrations are also included.

38 **POWER SHOVELS**—Baldwin-Lima-Hamilton Corp. has brought out bulletins describing and illustrating the Lima Type 34 and 44 power shovels, cranes, draglines and pull shovels on crawler and wheel mounts.

39 **PRESTRESSED CONCRETE** — Lakeland Engineering Associates, Inc., has released load tables for Leap prestressed concrete products including double tee roof slabs, floor channels, bridge decks, piling and bleacher seats.

40 **PROGRAM CONTROL** — Minneapolis-Honeywell Regulator Co., Industrial Division, has issued Bulletin 1130, entitled "Program Control of Process Variables," describing the methods and advantages of automatic, time-conditions control. A selection chart is included. For a copy of the bulletin, write direct to the company at Wayne and Windrim Ave., Philadelphia 44, Penn.

41 **PYROMETERS** — The Bristol Co. has brought out literature giving data on the application possibilities of a linearizing cam which converts a non-linear thermocouple millivolt signal into a straight-line uniform form for recording and controlling.

42 **REAGENTS** — American Cyanamid Co., Mineral Dressing Dept., has issued a brochure describing in detail Aerofloc reagents for thickening or filtration operations. Suggested testing methods and available reagents are given.

43 **RING GEARS** — The Falk Corp. has announced Bulletin 6170, comparing design and operating characteristics of various type ring gears to drive kilns and mills. Drawings and photographs are included.

44 **SKID-SHOVELS** — Drott Manufacturing Corp. has published a 16-page catalog listing the complete line of International Drott skid-shovels and attachments. Included are specifications and typical application photographs.

45 **SCREENING** — Southwestern Engineering Co. has issued Catalog 112-14, giving photos, drawings and detailed specifications of equipment for screening more than 241 different materials. A data file is also included.

46 **SPEED CHANGERS**—Allis-Chalmers Manufacturing Co. has released Bulletin 20B6013D, entitled "Texrope Drive Speed Changers," giving operating advantages of "Vari-Pitch" speed changers. Arrangement diagrams, selection table and a speed range table are included.

47 **SPEED VARIATOR**—The Cleveland Worm & Gear Co., Speed Variator Div., has announced Bulletin K-200, describing and illustrating the Cleveland Speed Varietor, listing advantages, operating characteristics, and speed ratings. A cutaway drawing gives assembly details.

48 **TRACTOR** — Caterpillar Tractor Co. has announced Form 31555, describing the features of the D9 tractor. Pictures of the tractor, engine and turbocharger plus brief specifications are included.

49 **TRACTOR SHOVELS**—Clark Equipment Co., Construction Machinery Div., has released a large size folder illustrating the uses, and describing the components of Michigan tractor shovels.

50 **TRACTOR WAGON**—C & D Manufacturing Co. describes the features and advantages of the Movall wagon for Caterpillar DW20 and DW21 tractors in a four-page catalog. A comparison chart is included, and typical application photographs are given.

51 **TWIN CRAWLER TRACTOR** — General Motors Corp., Euclid Div., has released a four-page, four-color catalog, No. 601, describing and illustrating the Euclid TC-12 Twin-Crawler tractor. The tractor design is described, and typical application photographs and specifications are given.

52 **VARIABLE DRIVE MOTORS** — U. S. Electrical Motors Inc. has issued Booklet 1882 on Varitrol Automation, and Booklet 1797 on U. S. Varidrive motors. Application illustrations and advantages are given.

53 **WATER PUMPS** — Layne and Bowler Pump Co. has published an eight-page folder, Bulletin 100, describing Verti-Line primary water supply pumps. Included are sectional illustrations with enlarged views of special features, drawings of pumping and distribution systems, a selection table and capacity ratings.

54 **WELDING EQUIPMENT**—Air Reduction Sales Co. has announced a 16-page catalog describing Aircomatic welding equipment, including manual and automatic units. Accessory apparatus and welding wire are also described.

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LIMA wagon cranes are self-propelled units with one engine mounted in the rotating assembly supplying the power for all crane operations. LIMA wagon cranes are available in 15, 20, 25, 30, 40 and 50 ton capacities.

LIMA'S fast service cuts costly downtime

From coast-to-coast Lima service engineers, warehouses and distributors are prepared to give you that extra-fast service or parts delivery which can make all the difference between continuous, profitable production and high-cost idleness of equipment.

When you buy a LIMA you can depend on long, trouble-free service, thanks to those extra quality features built into every LIMA. But if trouble happens and you need help, you get it from Lima . . . fast!

COMPARE QUALITY! No other machine gives you as much as LIMA!

1. Piston ring type dirt seal rings and retainers in crawler rollers.
2. Moving parts are flame or induction hardened for longer life.
3. Main machinery is placed well back of center of rotation.
4. Anti-friction bearings at every vital bearing point.
5. Big capacity drums and sheaves are easy on cables.
6. Propel and swing gears and power take-off are enclosed in a sealed oil bath.
7. Torque converter (optional on certain types).
8. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts to keep your LIMA on the job continuously.

COMPARE and you'll specify LIMA for shovels (to 6 yds.), cranes (to 110 tons) and draglines (variable). Smaller capacities available on rubber.

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Aerial view of quarry and plant. Scraper and bucket operated by electric motor driven hoist moves stone from quarry stockpile to plant. Farm which has been rehabilitated with agricultural limestone and superphosphate, in foreground

Spreading Limestone By Plane In New Zealand

• Taylor's Lime Co., Oamaru, New Zealand operates one of the largest agricultural limestone plants in Australasia. Freight rate subsidy to encourage use

By LYN HARRINGTON*

IN THE PAST QUARTER-CENTURY, Taylor's Lime Co. of Oamaru, New Zealand, has built up an unusually successful agricultural limestone business with assets of over $400,000, selling a product which could scarcely be given away when started by W. J. Taylor in March, 1929. At present production rates, the company's leased mineral lands, on which royalties are paid, are sufficient for 2000 years of operation.

New Zealand has become conscious of the need of liming materials on its hilly, and often sour, soil, so that small companies are springing up throughout the country. But Taylor's still has double the output of any producer in Australasia, at 130,000 tons a year. It is the only producer to guarantee the quality of its product; and it refuses to sell anything less than 95 percent calcium carbonate. By test, it actually averages 97.5 percent.

*Illustrations by Richard Harrington.

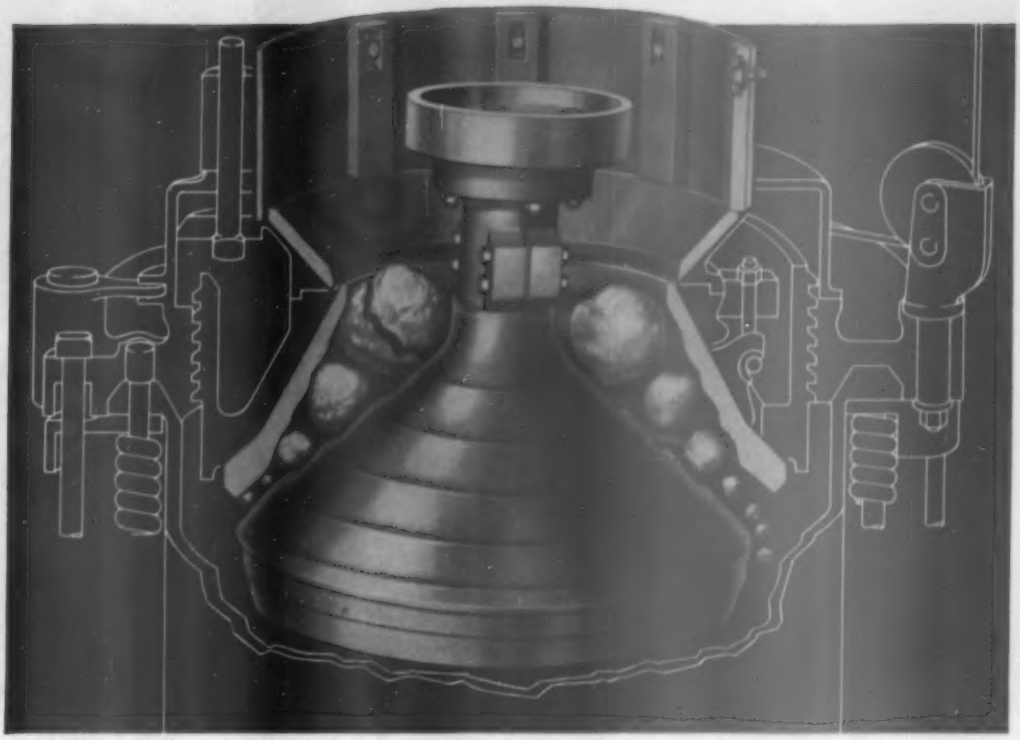
Co-owners of the company and sons of the founder are the three Taylor brothers, Ivan, Lindsay, and Alan

The three Taylor brothers, now directors and sole owners, believe the high grade accounts for volume of sales, rather than the efficient operation.

The Taylor plant is located four miles outside Oamaru (a town on the south island's east coast), on a paved highway and with its own railway siding. Agricultural limestone is distributed mostly by rail to points 140 miles north and 200 miles south. While at one time the entire output was shipped in tied bags, an increasing amount now goes out in bulk. When in bags, it is shipped without securing the top. This calls for careful stacking in the railroad cars, but it saves time and expense. Some 60,000 tons are shipped in bulk, the remainder in bags. Capacity of the plant is much greater, but is limited by available railroad cars.

(Continued on page 92)

AMSCO® CRUSHER PARTS "give" a little to TAKE MORE PUNISHMENT



Amsco crusher parts are made of the toughest steel known—manganese steel. Typical of the Amsco line are the mantle and bowl liner in this sketch of a Symons® Cone Crusher. Symons is a registered trademark of Nordberg Manufacturing Company.

Under the violent crushing forces of impact, abrasion and pressure, the surface of Amsco manganese steel crusher parts work-hardens to as high as 500 Brinell. Yet beneath the working surface, the metal remains strong and ductile . . . able to *give* slightly under crushing forces . . . developing hardness as a new working surface is exposed by wear. That's why manganese steel crusher parts last so long, enduring severe abuse and resisting cracking or chipping even when worn thin.

Amsco makes manganese steel crusher parts for most manufacturers of crushing, grinding and pulverizing equipment. Buy your replacement parts from your crusher manufacturer to be sure of getting Amsco manganese steel.

Amsco also produces other alloy steels with maximum wear resistance under particular service conditions.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

Tractor with bulldozer blade down pushes broken stone to the point where quarry bench drops off in the direction of the plant. The pillars of limestone have been left to serve as anchoring points for the cable which operates scraper bucket

Tractors, bulldozer blades and rooter, have transformed the industry in New Zealand, and have kept costs low. The scant overburden of soil and scrub thorns is stripped off by bulldozer blade. The excavating is done with a 130-hp. D8 Caterpillar tractor which pulls a large five-pronged rooter made in Los Angeles, that breaks the limestone out of the solid floor of the quarry. At a conservative estimate, the rooter can loosen up 225 tons in an hour. Up to 1942, dynamite had been used. The stone is very soft, easily rooted out and a ton has a volume of 30 cu. ft. The quarry floor is about five acres in area, and the limestone bed is 150 ft. deep.

Loosened rock is bulldozed into a stockpile where the dragscraper bucket picks up the material and carries it down to the mill. Powered by 150-hp. electric motor, the Sauerman 4-cu. yd. capacity hoist (double drum winch) has a ¾-in. return cable, 2700-ft. long, travelling at 500 f.p.m., and a 1⅛-in. pull cable, 1600 ft. long, operating at 250 f.p.m. The 7-cu. yd. scraper bucket and hoist has a capacity of 60 t.p.h.

Special Roll Crusher

The limestone is delivered to an automatic chain type feeder which carries the material into a Taylor Slogger. This is a double-roll crusher, designed and patented by the plant owners, now in use throughout the agricultural limestone industry of New Zealand. One roll travels at 800 r.p.m., the other at 20 r.p.m. The stone is fed into the crusher between the two rolls, and is crushed and forced through the adjustable gap. Designed for crushing wet, sticky limestone, it is practically impossible to block this machine, as the back of the slowly revolving roll is constantly scraped clean, thus presenting a clear face to the hammers at all times.

From the "slogger," the minus 1¾-in. stone is elevated to a 7- x 60-ft. rotary dryer, which dries the stone at the rate of 50 to 60 t.p.h. The inside of the dryer, which operates at 6 r.p.m., is fitted with a series of lifting blades which raise the material to the top, and drop it through the hot air. The dryer has a 3-ft. 9-in. inclination. It is coal-fired, the firebox being inserted into the end of the cylinder. The 6 to 7 tons of fine coal consumed per day comes from the company's own open-pit mine north of Oamaru.

Once dried, the material is carried by bucket elevators up to screens with $\frac{5}{16}$-in. openings placed at a 45 deg. angle above a 3- x 10-ft. stationary box. The fines passing the screens go to bucket elevators and into the 1000-ton storage bin. Oversize drops into the pulverizer to return through dryer, screen and elevators to storage. The pulverizer is a combination of Jeffreys and Edgar Allen types, with only half the hammers and no bars, which might be damaged by tramp metal. A Multiclone dust-collector is efficient in keeping the mill clean, and the fines are returned to the stockpile.

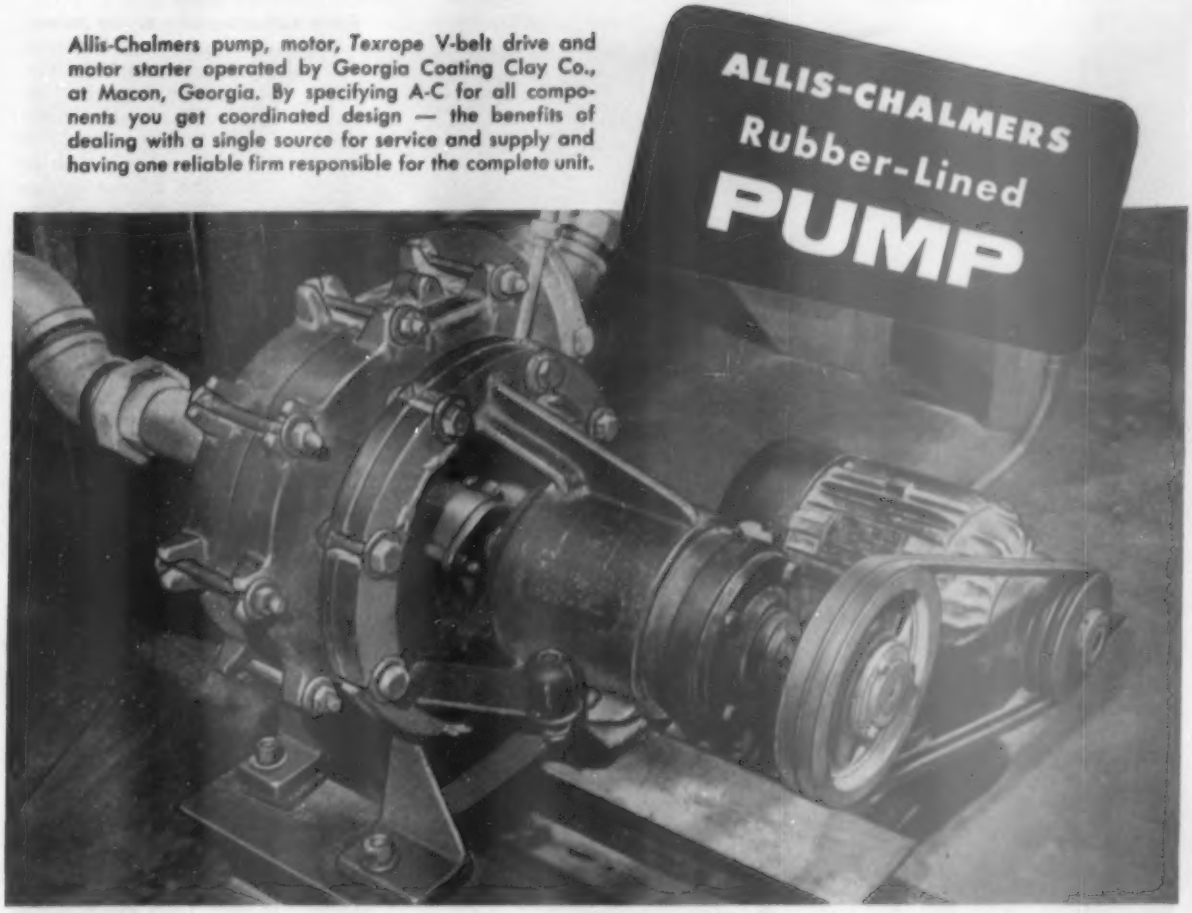
The agricultural limestone can be loaded direct from bins to railway cars or into trucks. About 250 tons comprise a train-load which can be loaded in ¾ hr. Two trains go out each working day. Since the railway is state-owned and without competition, the output is curbed by the number of cars available. These have long been in short supply, but hundreds are now on order from England, some with bottom dump. Trucking is legally limited to a radius of 30 miles, except where there is no rail service.

With a view to encouraging the use of agricultural limestone in agriculture, the New Zealand government formerly subsidized rail hauls of 100 miles. It now pays 15 percent of the haulage costs, the remainder being paid by the farmers' own surplus-pool. This enables the average farmer to apply

Tractor drawing rooter tears soft limestone from quarry floor at the rate of 225 t.p.h.

Ivan Taylor holds a lump of limestone excavated by tractor-drawn rooter

Allis-Chalmers pump, motor, *Texrope* V-belt drive and motor starter operated by Georgia Coating Clay Co., at Macon, Georgia. By specifying A-C for all components you get coordinated design — the benefits of dealing with a single source for service and supply and having one reliable firm responsible for the complete unit.



In 7 months' continuous duty...
NO MAINTENANCE

Georgia Coating Clay Co. uses A-C Rubber-Lined Pump to move highly abrasive clay slurry

SINCE ITS INSTALLATION IN MARCH, 1954, this Allis-Chalmers Rubber-Lined Pump has been operating "round the clock," handling 17% to 36% clay slurry with pH ranging from 5.0 to 7.0. The previous pump required impeller replacement about every six weeks.

Long Life, Lasting High Efficiency

With Allis-Chalmers Rubber-Lined Pumps you can make adjustment to maintain proper clearances between the impeller and the casing. This adjustment — which prolongs pump life and efficiency — is merely a matter of resetting adjusting screws. Owners report A-C Rubber-Lined Pumps last from 10 to 50 times as long as hard alloy pumps.

GET ALL THE FACTS...

Find out how these new pumps help you maintain high output, cut maintenance, service and down-time costs. See your representative or write Allis-Chalmers, Milwaukee 1, Wis. Ask for Bulletin 52B8156. A-4543

Texrope is an Allis-Chalmers trademark.

ALLIS-CHALMERS

Over hilly pastures and wet land, an airplane is used to distribute agricultural limestone

agricultural limestone who could not otherwise do so. About 1 ton every three to four years is the usual application, although some farmers in the west Southland apply it yearly for 10 to 12 years.

Aerial Top-Dressing Planes

To boost use of their product, the Taylors went into the limestone spreading business 12 years ago. However, they encourage truck owners to take over this service, and were able to dispose of that business last October. Some 14 owner-operators now drive up to the Avery scale to take on bulk loads for distribution over farmers' lands. A considerable quantity of agricultural limestone is also spread by aerial top-dressing planes, and this is expected to increase in very hilly and wet areas.

"Lime when you've got time" is the Taylor slogan which overcomes an aversion to putting lime on the land except in spring. The producers point out that limestone does not deteriorate in stockpiles and can be spread at any season, except where the soil is too wet to sustain the weight of the spreader.

Stockpiling dry agricultural limestone is a means of keeping the workers in full employment; one to three shifts in the quarry working by floodlight at night, two to three shifts in the mill itself. It also means a continuity of supply for the farmer even in rush seasons. There are three large stockpiles of 6000 tons each alongside the railway inland. Dried agricultural limestone forms a crust and does not absorb moisture in six months' exposure. The New Zealand Railway also built a large storage bin north of Oamaru, and the company stores about 25,000 tons each year.

New Zealand leads in aerial topdressing of superphosphates and an increasing amount of agricultural limestone is distributed by plane

Some farmers prefer to use pulverized but not dried agricultural limestone on their fields. It is harder to handle, but less dusty. To produce this, the company diverts the crushed limestone over a wire screen onto a belt conveyor for delivery to an outside stockpile. From there, a bulldozer can push 12 tons at once onto a spreader-truck standing on the weighing scales.

New Zealand labor operates on a 40-hr. week with a basic wage set by the government for every individual job. With an overall staff of 30, the management at Taylor's Lime Co. figures they get an extra 30,000 to 40,000 tons of production each year by paying a bonus on production. Top men receive $12 to $15 a week extra in bonus, a worthwhile incentive. Because of higher-than-national-average production per man, Taylor sells the product at $2.45 per ton, an increase of only 45¢ in 14 years.

Advertising and Promotion

The company is more aware of the value of advertising than many New Zealand firms. Billboards set up along the highways urge farmers to increase production by use of Taylor's agricultural limestone. Similar advertising is carried in newspapers. In addition, a full-time traveling salesman is employed, and the three owner-brothers make it a point to visit agricultural stations and contact implement dealers.

Their own background of sheep-ranching in early years makes it easy to chat with farmers and to recognize their probems. Best advertising of all, however, is a nearby 40-acre farm which was badly rundown. The Taylors rehabilitated it with agricultural limestone and superphosphate. Leased to a sheep rancher, its large carrying capacity speaks for itself to passersby on the highway.

Quarry for St. Lawrence Seaway-Power Project

C. A. PITTS GENERAL CONTRACTORS, LTD., Toronto, Ontario, has completed a new crushed stone plant at Cornwall, Ontario, which will supply 1,251,000 tons of coarse aggregate and 691,000 tons of manufactured stone sand for the Ontario Hydro-Electric Commission's St. Lawrence Seaway power project. Production will commence in July, but initial delivery of aggregate will be in September.

Africa's Largest Lime Plant

A NEW LIME PLANT has been opened at Silverstreams, South Africa, about 100 miles west of Kimberley; it is expected to develop into one of the world's largest lime plants. Part of the output will be used in a uranium-extraction process.

IN THE CRUSHED STONE INDUSTRY, TORRINGTON BEARINGS *are used in many applications, including crushers, screens, shovels, cranes, pulverizers, grinding mills and rotary kilns.*

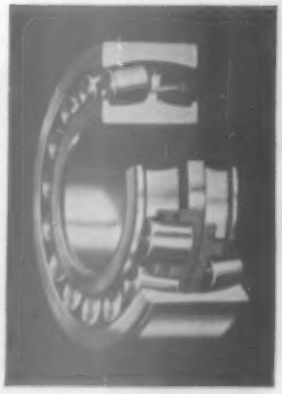
TORRINGTON Spherical Roller Bearings

are designed with machined, cast-bronze, land-riding cages—one for each path of rollers—to assure true rolling operation

Other TORRINGTON SPHERICAL ROLLER BEARING features are equally important in assuring top performance. Contact surfaces are precision ground for even load distribution, long bearing life. Rollers and races are carefully heat treated to give maximum resistance to shock and wear.

An integral center flange gives positive radial stability and accurate positioning of thrust loads—an essential factor for longer service life. Contact surfaces possess geometrical conformity, giving ultimate load carrying capacity.

These are reasons why TORRINGTON SPHERICAL ROLLER BEARINGS give you long, low-maintenance service in the toughest, heavy-duty applications. Get the most for your bearing dollar—specify TORRINGTON.



THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.

District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON SPHERICAL ROLLER BEARINGS

Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

Left: Scraper bucket is used for excavation. **Right: Hoist installation** to operate scraper bucket is mounted on steel structure with office facilities below

Sand-Gravel Plant Serves As Laboratory for Crusher Tests

• Beeler Canyon Sand & Gravel Co., Escondido, Calif., operates compact sand and gravel plant, using roll crusher in combination with jaw crusher and screens, for production of 130 t.p.h. with two men for the entire operation

By WALTER B. LENHART

THE BEELER CANYON SAND & GRAV- Co., Escondido, Calif., was formed primarily to build and operate a sand and gravel plant to demonstrate a new type of roll crusher that is the heart of the operation. The plant started August, 1954. Escondido is a few miles north of San Diego, and close to the area made famous by the romantic novel "Ramona."

Several years ago the Waldrip Engineering Co., Hollydale, Calif., developed a roll crusher with several unusual features. As shop trials to test the performance of the crusher proved inadequate, the Beeler Canyon Sand & Gravel Co. was formed to give the roll crusher a series of long range performance tests. The plant is located a few miles south of Escondido in Beeler Canyon. It produces a dry sand and gravel aggregate that is trucked to ready-mixed concrete plants in the vicinity, and for use as a plant-run road stone. The material produced ranges from a minus 1¼-in. to 1⅝-in. aggregate which has passed through a primary jaw crusher and the Waldrip Roto roll crusher used as a secondary unit. The plant is capable of producing 130 t.p.h. with two men. Of this tonnage, roughly 60 percent goes through the roll crusher.

View of entire compact sand and gravel plant set-up

The operation is quite simple and the plant very compact. Excavation is done with a 4-cu. yd. Sauerman-type, Crescent scraper, powered with a Model DC-644 Buda diesel. The scraper delivers to a hopper under which is a reciprocating feeder that delivers to a short belt conveyor serving the 10-x 36-in. Cedarapids primary jaw crusher. Throughs from the crusher fall to a flat-running belt conveyor which delivers the material to a three-deck

Thermoid Hose designed specifically for use in quarries

Thermoid designs and manufactures many types of hose built to give longer service and lower operating costs in a wide variety of specific applications. Here are three that are ideal for rugged quarrying and construction work:

THERMOFLEX—Mandrel-built air hose for extreme service and direct connection to compressors. Smooth, black abrasion-resistant cover.

VERSICON—Most versatile hose ever developed. Handles air, water, oil, gasoline, dilute acids and gases. Ideal for use with air-operated tools.

#325 CL SUCTION HOSE—Heavy duty wrapped hose reinforced with rugged wire enclosed in a woven cord carcass. Long wearing tube and cover resists weather and abrasion. Can be restored to shape after crushing.

Thermoid research is responsible for new, better hose construction which makes Thermoid Hose more durable . . . easier to handle. Quarrying and construction work also demands the best in Conveyor Belting and Multi-V Belts. Ask your Thermoid Distributor for complete information on all these Thermoid Products. Or if you prefer, write direct.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

Primary jaw crusher, vibrating screen, new type roll crusher and magnet to remove tramp iron are all mounted on structural steel frame and skid assembly

screen of which only one deck is being used for scalping at present. The screen is similar to the Largo screen that at one time was made by the operators of the Largo plant of Consolidated Rock Products Co. Oversize from the screen falls to the Roto crusher. As the primary crusher is set to a 2-in. minimum opening, some 3-in. gravel and larger size flat pieces go to the roll crusher. The roll crusher is set to ⅝ in. Throughs from the rolls join the material from the primary crusher on the flat belt conveyor.

Excavated material is from alluvial deposits that flank the Beeler Canyon drainage ravine, and is from 9 to 12 ft. deep with practically no over-burden. The average pit-run has a Los Angeles rattler rating of 29-33 so is sufficiently hard to give the new crusher adequate field trials. The Roto crusher rolls are 32-in. dia. with a 20-in. face, and it is powered with a 50-hp. motor. The roll segments in use at the time of inspection were hard faced with No. 1293 Stoodite, and were giving such good results that this type of hard facing may become standard.

The unique feature of the Waldrip Roto crusher is the use of timing gears which, along with the bull and pinion gears, are so designed that the spacing of the rolls can be changed without moving timer or bull gears. The bearings are anti-friction and run in oil. The rolls are suspended and held in position with a combination nitrogen-oil hydraulic system that permits tramp iron to pass through the rolls. Cylinders 10 in. in diameter use nitrogen gas at 280 p.s.i. to control the hydraulic system. Hydrogen gas is used as it is commercially available in cylinders up to 800 p.s.i., and at high pressures is not considered dangerous. The rolls are enclosed in a steel housing with the assembly weighing about 24,000 lb. Should the plant stop, the hydraulic system, apart from convenience of changing shims, allows the operator to instantly open up the rolls and allow material in the crusher to drop through. No star gears or chains are used. One series of "V" belts in conjunction with an Ideal gear reduction unit, drives the two cores. The shells come in four segments per roll, and for this unit weigh about 500 lb. each. Holes are provided in the sides of each segment to handle them with a pair of "ice tongs." The segments are slipped under the fixed retaining ring on one side of the cores, and are clamped to the core by split ring segments on the opposite side. Segments may be removed singly or otherwise. The shells also have cast-in-place keys to prevent the rolls from slipping on the cores. The timing gears keep the corrugated rolls in positive mesh at all times. The use of corrugated rolls (horizontal corrugation) permits a larger sized rock to be fed to the crusher. On the original design the roll faces were concave-convex, but this design, after field trials, was abandoned in favor of the straight, horizontally corrugated faces which proved to be more efficient.

Long period and high tonnage tests will soon be made, using the rolls to manufacture sand as the crusher appears to have excellent possibilities in that field, operating either wet or dry. Preparation of a washed sand and gravel may also be undertaken later at the Beeler Canyon site.

The processed 1⅝ to 1¼-in. material is stacked in a large ground storage pile with a reclaiming belt conveyor operating in the tunnel. The tunnel is of steel construction, rectangular in cross section, and made up in sections that are spot welded into place. This type of construction permits the assembly to be easily moved. Truck drivers load their own trucks, and in the tunnel is mounted an Esterline-Angus recording meter that functions every time the reclaiming belt conveyor is placed in operation. This gives a time-check on deliveries, and affords an excellent check on tonnage delivered per load as the belt conveyor consistently delivers 3½ tons per minute at the present settings. A second needle on the recording meter is used to indicate the number of plant hours run, and is connected to the feeder control of the reciprocating feeder. Electric power is purchased.

Offices of the company are at Hollydale, Calif., care of Waldrip Engineering Co. William Sprague is the principal owner, and Freeman Gates is field manager. C. E. Lindley and Russell Stein, both of Escondido, constitute the field production personnel at the plant.

Tractor-truck-trailer combination for hauling materials to destination

Through a river in Colombia . . .

Through a city of 237,000 . . .

Tournapull Rear-Dump hauls gravel for new stadium

In the city of Medellin, Republic of Colombia, this 18-ton Tournapull Rear-Dump travels a difficult route while hauling construction materials to the new municipal stadium.

First, the Rear-Dump is driven through water 1.6 to 2.6 ft. deep to be loaded with river-run gravel and sand needed for the stadium's concrete construction. Water often covers rig's undercarriage during these trips, but this has not harmed, or even affected, the electrical control system or brakes. Despite this loading in water, in more than 2,000 hours of service, machine has needed practically no repairs.

Once out of the river, haul road leads through Medellin, a city of 237,000 people. Easy maneuverability and powerful four-wheel air brakes allow Rear-Dump to drive along busy thoroughfares without delaying normal traffic or endangering other vehicles. Rear-Dump has traveled city streets for two years, and has never been involved in an accident.

Whenever you have earth to move, investigate the many advantages offered by modern LeTourneau-Westinghouse equipment. Ask your local Distributor to give you facts and figures on the size Tournapull Rear-Dump you need — 9, 18, 35, or 50 tons. He is always at your service.

Here's what city officials think of their Tournapull Rear-Dump

Dr. Jorge Ortiz Rodriguez
Mayor, City of Medellin

"We are satisfied with our Tournapull which has given us uninterrupted service for approximately two years. Cost of operation is so low that we are considering purchase of an additional unit. Safety feature of the 4-wheel air brakes permits use in our city without danger or interruption of traffic flow."

Dr. Alberto Puerta-Puerta
Chief Engineer, City of Medellin

"Tournapulls and their ability to operate in wet conditions, such as river bottoms where they can obtain large loads of heavy, water-filled pit-run gravel and sand, have proven to be one of the solutions to our problem in Medellin. Maneuverability and radius of turning is a great factor of safety for haulage through the city."

Dr. Francisco Elbdio Gomez
Director of Purchases, City of Medellin

"Under conditions of haulage through river bottoms in water, and heavy loads of gravel and sand, consumption of spare parts and tire replacement have been astoundingly low. Little or no troubles have been experienced with electrical mechanisms, and operators are satisfied with the machine."

LeTourneau-Westinghouse Company

PEORIA ILLINOIS

A Subsidiary of Westinghouse Air Brake Co.

Tournapull—Trademark Reg. U.S. Pat. Off. R-383-8-b

A.S.T.M. Convention Contributes New Knowledge On Cement—Concrete

• Committee reports and papers presented to the American Society for Testing Materials reveals research progress in cement and aggregates studies

A LOT OF TERRITORY in our rock products industries will be covered in the assembled proceedings of the annual convention of the American Society for Testing Materials, Atlantic City, N. J., June 26 - July 1. Since the entire proceedings are eventually published in book form, we shall attempt here to list only a few high points which seem of the most current interest to our readers. These are concerned chiefly with cement and concrete.

Slag Cement

Committee C-1 on Cement has at last come through with a Tentative Specification for Slag Cement, which appears to be something less than a compromise between those who would place a low limit on the magnesia in slag and those who wouldn't. The "scope" of the specification limits "slag cement" to a material to be used "as a blend with portland cement in making concrete, and as a blend with hydrated lime in making masonry mortar." Two types are listed, one of which contains an air-entraining agent. Note that slag cement is apparently intended by the specification writers to be used only as *a blend with portland cement*. However, most engineers and architects must know that it makes a pretty good hydraulic cement as is, since it is so described in all textbooks relating to hydraulic cement.

Slag cement is defined as a "finely divided material consisting essentially of water-quenched granulated blast-furnace slag and hydrated lime. It shall consist of at least 60 percent water-quenched, blast-furnace slag by weight." Nothing is said as to the chemical requirements of the hydrated lime, nor are specific limits given as to the chemical analysis of the slag, but there is a specific maximum limit of 5 percent on the MgO in the finished cement, which of course rules out the use of a magnesium hydrated lime, even though it might be 100 percent hydrated. Also, it is evident that a slag containing as much as 8 percent magnesia would be ruled out, depending on how much MgO the hydrated lime and the cement clinker might contain. It is hardly likely that the controversy over MgO will end here, because both slag and lime manufacturers have some strong arguments and data to show that MgO in some of these products cannot be harmful.

Alkali-Aggregate Reaction

A little new light was thrown on the mysteries of the alkali reaction in concrete in a paper by George Verbeck and Charles Gramlich, both with the Portland Cement Association Laboratory. By means of a specially constructed osmotic cell the authors tested the effect of a portland-cement paste membrane on the diffusion of alkali and calcium hydroxides into a pocket of reactive aggregate. The experimental set-up is presumed to stimulate conditions in concrete which contains the same ingredients. Presumably, too, some of the experimental data developed were utilized by T. C. Powers and H. H. Steinour in their A.C.I. paper which is commented upon elsewhere in this issue.

In conclusion the authors say: "The experimental data include the effect upon osmatic pressure of (1) the permeability of the neat cement paste membrane; (2) alkali concentration; (3) different alkalies; (4) calcium hydroxide; (5) particle size of aggregate, and (6) reaction temperature." The main conclusion apparently is: "The formation of expansive low-calcium reaction products in concrete which contains large quantities of calcium hydroxide is attributed to the low mobility and solubility properties of calcium hydroxide in the cement paste membrane surrounding the reactive aggregate. The mobilities of alkali and calcium hydroxides are presumably not independent; each is affected by the permeability (capillary pore size, etc.) of the paste, the size of the hydrated ion complex, and possibly electrokinetic phenomena, or the surface charges on both the paste membrane, and the reactive aggregate, or both.

"It is further postulated that the nature of the reaction product does not alone control the expansion or lack of expansion in a concrete matrix, but that the permeability of the paste and quantity of water present determine the extent of osmotic pressure developed by an expansion producing end product. If the permeability of the paste is high and considerable water is present, an expansion producing gel may not produce over-all expansion of the matrix.

"This hypothesis suggests the possibility that a fundamental and practical remedy to deleterious alkali-aggregate reaction might be obtained by physicochemical adjustment of the mobility functions of alkali and lime by additives (inhibitors) or surface treatment of aggregate."

The preceding paragraph is stated in rather technical language, but it would seem that if surface treatment of the aggregate is a feasible answer, this could be accomplished rather simply by first drying the aggregate and then soaking it in lime water, or possibly soaking in a calcium chloride solution, which also would supply calcium ions.

Aggregate Specifications

Committee C-9 on concrete aggregates has been busy for several years now in an attempt to reach a satisfactory coverage of potentially "alkali reactive" aggregates. The committee is unwilling to accept as decisive any of the present laboratory methods for testing alkali-reactive aggregate, but the specifications include them in a footnote as a matter of information. The following note, also included, really expresses the present attitude of the Committee: "A number of methods for detecting potential reactivity have been proposed. However, they do not provide quantitative information on the degree of reactivity to be expected or tolerated in service. Therefore, evaluation of potential reactivity of an aggregate must be based on judgment and in the interpretation of test data and examination of concrete structures containing aggregates and cements for use in the new work."

(Continued on page 102)

100 miles per day

for general clean-up tractor at large Eastern quarry

Thousands of tons of limestone and overburden are removed daily from this Eastern pit, one of the largest quarries in the country. Recently, to speed clean-up on the several hundred acre spread, the quarry owner replaced a crawler-tractor with a 186 hp rubber-tired electric-control Tournatractor.

This 19 mph unit proved so successful, it now works 3 eight-hour shifts daily, 5 days per week. Each day, it travels more than 100 miles around the pit to do its work — 40 to 45 miles on the day shift, 30 to 35 miles on each of the two night shifts.

All-purpose tool

Its major assignment on all shifts is to clean up for 2 shovels, located 1½ miles apart, and to maintain 2 overburden dumps. Traveling job-to-job at speeds to 19 mph, it usually makes 4 trips per shift to each of the shovels and 4 trips to each of the dumps. In addition to these 16 trips and 16 clean-up periods per shift, the versatile unit still finds time to do odd-lot tasks. Five or six times a day, it cleans up around the crusher. During travel between shovels and dumps, it helps a motor grader clean rock spillage from the haul roads.

OPENED 40 YEARS AGO, THE QUARRY NOW PRODUCES 15,000 TONS OF MATERIAL DAILY

Most is put through large primary crusher on the following schedule:

DAY SHIFT

1. Limestone: bulk of tonnage shipped by rail.
2. Undersize stone: part made into agricultural lime; balance used for commercial stone.

NIGHT SHIFTS

3. Commercial stone: sold locally for highway and concrete work.
4. Sand: sold locally for highway and concrete work.
5. Rip-rap stone: supplied primarily to railroads.
6. Removal of overburden varying from 6 inches to 40 feet in depth. About half is stone suitable for local sales; the rest, low-quality stone and dirt, is dumped into worked-out sections of quarry.

Instant-shift, constant-mesh transmission enables this highly mobile unit to doze in and back away in a hurry, without delay to shovel. Torque converter eliminates jolting gear changes.

Despite its greater speed, men on the job report Tournatractor has been far less costly to maintain than track-type tractors. In 9 months of round-the-clock routine, the machine has been shut down only 3 times for minor repairs, not at all for major repairs. Its mechanical efficiency has been better than 95%.

"Tournatractor has done a good job — especially on shovel clean-up," says the assistant quarry superintendent. "Its mobility is very satisfactory."

"I like the rubber tires," adds the Tournatractor operator. "They get you to a job faster, and help you do the work faster. The fine seat makes work a lot easier, too."

If your work involves abrasive materials, or jobs scattered around a large area, it will pay you to investigate Tournatractor. Ask for a demonstration!

Tournatractor—Trademark T-620-Q-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

YUBA PLACER DREDGE DIGS, TREATS, STACKS 18,000 TONS GRAVEL DAILY...

This placer dredge with 18 cu. ft. buckets digs to 125' below water, averages better than 22 hours running time daily. Intricate treatment equipment on board limits digging to only 18,000 tons of gravel per day. For sand and gravel digging only, an 18 cu. ft. YUBA dredge can produce as much as 40,000 tons daily.

5¢ Per Ton

YUBA gold dredges or other bucket ladder dredges of this type can be converted to dig and screen sand and gravel at operating costs substantially under 5¢ a ton. Equipment for more extensive sizing, scrubbing or other separation processes can be installed to finish products at costs per ton comparable with the low costs on dredges used in the mining industry.

Another big advantage — YUBA dredges float in their own ponds and excavate gravel without lowering surrounding water levels.

Long Operating Life

With YUBA dredges you get both low production costs and long operating life—many YUBA dredges are operating efficiently after 25 years or more of rough service.

Consult YUBA NOW. We will design and build a new dredge to fit your ground; or help you find a used dredge, and move, redesign and rebuild it. Wire, write or call us—no obligation, of course.

Profusely illustrated, 40-page brochure, "YUBA Dredges," yours for the asking.

YUBA MANUFACTURING CO.

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CABLES: YUBAMAN, SAN FRANCISCO SHAWDARBCO, LONDON

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A.S.T.M. Convention

(Continued from page 100)

Carl A. Menzel, of the Portland Cement Association Laboratory, presented a paper, "A Method for Determining the Moisture Condition of Hardened Concrete in Terms of Relative Humidity." The paper describes a rapid method and simple apparatus for determining the moisture condition of hardened concrete block and expressing the results directly in terms of relative humidity. With slight modifications the same method can be used to determine the moisture condition of hardened concrete at the surface and interior of larger specimens such as wall and floor slabs.

The author's conclusions are: "The test procedure outlined may be used in two ways: (a) *As an acceptance test* that will indicate whether or not a given lot of block meet the degree of dryness required by specifications for a specific purpose. (b) *As a plant inspection test* that will indicate to the block manufacturer the moisture condition of different lots of block at the plant so he will know when they are dry enough or what further drying is required for a specific purpose."

Freezing and Thawing

T. C. Powers, of the Portland Cement Association Laboratory, in a paper: "Basic Considerations Pertaining to Freezing-and-Thawing Tests" explained some of the vagarities in laboratory tests designed to develop information on the durability of concrete. This paper is the same kind of a logical analysis of test results that the author and H. H. Steinour made of the alkali-aggregate reaction problem. It puts special emphasis on the effects of freezing and thawing on pieces of large aggregate when enclosed in concrete. As a result of his analysis of existing test methods, the author suggests a new procedure, the purpose of which he describes as follows:

"It should first be recognized that concrete has no intrinsic property that is, *per se*, frost resistance or durability and, therefore, that it appears futile from a basic viewpoint to attempt to measure frost resistance or durability. Intrinsic properties that determine behavior under a given set of circumstances can, however, be determined. Such properties include strength, permeability, porosity, pore size distribution, stress-strain-time characteristics, thermal characteristics, and others. With quantitative knowledge of these characteristics, behavior [of the concrete] could conceivably be predicted under any given set of circumstances."

(Continued on page 105)

RAYMOND

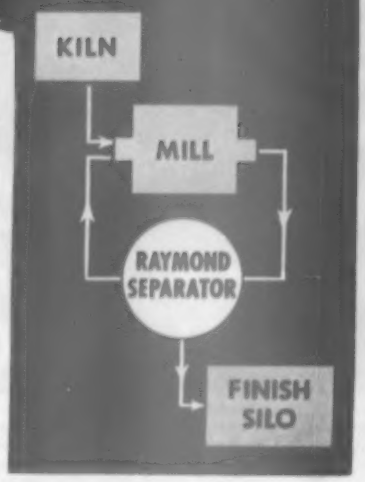
WHIZZER SEPARATION

For

CLASSIFYING SUPERFINE MATERIALS

and

DEDUSTING GRANULAR PRODUCTS



RAYMOND MECHANICAL AIR SEPARATORS available in Single Whizzer Type or Double Whizzer Type (as shown) and in sizes from 2'6" to 18'0" in diameter for various capacity requirements—also 10-Inch Laboratory Separator.

SINCE 1887

FOR CLOSED CIRCUIT GRINDING the Raymond Whizzer Separator is an important link in your cement production line for increasing capacity and maintaining uniformity with consistent reduction in cost.

The RAYMOND Whizzer-Equipped Mechanical Air Separator is a modern design classifying unit that assures economy and uniformity in producing various grades of powdered materials in the non-metallic minerals industry.

Whizzer Separation is effective in maintaining particle size within close limits to meet exacting fineness specifications, and it also increases overall output of the system, as much as 75% or more in closed circuit grinding operations.

With the proper setting of the separator, the slide damper controls can be adjusted externally to provide any fineness specifications from standard Portland cement to the high early strength grades.

Raymond Whizzer Separators are equally efficient in making consistent end products in a range of 50-mesh to 99.9% or better passing 325-mesh, or for dedusting a material to remove objectionable fines. These machines find wide use in the chemical, food and process industries.

Ask for Raymond Separator Bulletin #76

COMBUSTION ENGINEERING, INC.

Raymond Division

1307 NORTH BRANCH ST.
CHICAGO 22, ILLINOIS

SALES OFFICES IN PRINCIPAL CITIES

ALCOA bars tramp metal from Hammer Mills

with RCA Electronic METAL DETECTORS

Tramp metal was a serious problem at Alcoa's Refining Division, Bauxite, Arkansas, damaging equipment and causing lost production and wasted manhours. To locate this "saboteur", RCA Metal Detectors were installed around the belts which carry the limestone to the hammer mills. They detect the presence of dangerous pieces of stray iron, tough steel parts or other fragments, and stop the line before damage can occur to the crushing equipment at the discharge end.

You, Too, Can Have This Protection—RCA Electronic Metal Detectors installed around your conveyors can put an end to the main cause of crushing machinery shutdowns —tramp metal—including non-magnetic metals such as manganese steel. Wired to sound an alarm, spray-mark metal area or stop the conveyors whenever trouble threatens, the RCA Metal Detector is completely automatic in performing its job. By reducing downtime and loss of production and protecting costly machinery, it soon pays for itself.

Get the full story. Ask about the installation and service facilities of the RCA Service Company.

RCA—the world's best name for QUALITY

RADIO CORPORATION of AMERICA

ENGINEERING PRODUCTS DIVISION · CAMDEN, N.J.

In Canada: RCA VICTOR Company Limited, Montreal

RADIO CORPORATION of AMERICA
Dept. W-306, Building 15-1, Camden, N. J.

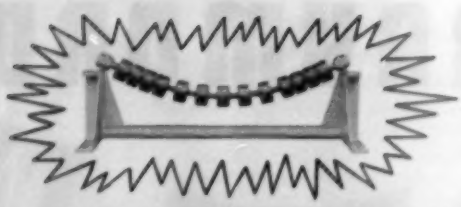
Please send me complete information on the RCA Electronic Metal Detector.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____



Where There's **ABRASION** *or* **CORROSION**

. . . This JOY IDLER OUTLASTS THEM ALL!

SHAPES TO THE LOAD . . . CUSHIONS, GUIDES BELT

The unique Joy *Limberoller* Conveyor Idler consists of neoprene discs molded on flexible steel cable. It's suspended from two bearings—one at either end, *up out of the dirt zone.* Illustrated is an installation in a dusty coke plant. In another typical job, handling abrasive foundry sand, Joy units have lasted *10 times longer* than any previous idlers and are still going strong.

Conveyor efficiency is assured and maintenance is a breeze when you switch to these Joy idlers. They exert a cushioned grip that supports the loaded belt without slipping, and keeps belt wear to a minimum. They're easier, faster and less costly to install, maintain, knock down and move than any other conveyor idler on the market, and are available for belt widths of 18", 24", 30" and 36". ● Get the details! *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.* In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

OTHER ADVANTAGES:

• Resists corrosion, abrasion, flame, grease • Weighs ⅓ less than steel idler • Handles both bulk and packaged materials • Easily changed without stopping belt • Compactly stored • Saves handling time

W&D I-5616

Ask for

FREE BULLETIN LD-103A WHICH GIVES COMPLETE DETAILS ON THE UNIQUE JOY LIMBEROLLER

JOY
A Leader Since 1851
LIMBEROLLER
THE IDLER WITH EYE APPEAL

A.S.T.M. Convention

(Continued from page 102)

Mr. Powers then presents a proposed procedure for determining some of these characteristics through laboratory tests. The idea back of his discussion is that not all concrete is subject to destructive freezing and thawing in service; that the natural conditions of freezing and thawing may be quite different from those set up in laboratory freezing and thawing tests, and that it is feasible to develop tests that will show what durability may be expected from any particular concrete under specific conditions. In other words, the approach seems to be a more logical one of trying to determine the factors that most affect durability, rather than to find out how readily any concrete can be destroyed if tests are apparently designed for that purpose.

Fire and Radiation

Perry H. Petersen, director, Materials Division, Research Department, U. S. Naval Civil Engineering Research and Evaluation Laboratory, Port Hueneme, Calif., presented a paper "Resistance of Concrete to Fire and Radiation (including jet aircraft blast)." The paper was concerned chiefly with methods of test and to observed results as to the character of the damage caused to concrete. In conclusion, as to the urgency of the problem, the author states: "The prevention against failure by heat of airport runway facilities, [rocket] launching platforms, and the like is of extreme importance to the military and also to the peacetime civilian pursuits of the United States. As has been indicated in this presentation, some research has been attempted to date but the bulk is still to be done. There are, in general, two methods which may lead to a solution of the problem. Possibly, each will supplement the other to good advantage. Thus far, the amount of actual damage to concrete surfaces in the field has been relatively light; however, it increases with every development leading to more intense exposure. Thus, this research and the method for solution should take into account at all times the ever-changing scope."

Needed Research

A. T. Goldbeck, engineering director, National Crushed Stone Association, discussed at some length "Needed Research on Concrete and Concrete Aggregates." It seemed to this reporter that the paper emphasized that research to date is far from complete or satisfactory in results. Among the subjects he discussed were: Con-

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crete durability—freezing and thawing tests; percentage of saturation; effect of air entrainment; effect of air entrainment in concrete containing unsound aggregates; alkali-aggregate reaction; sea-water exposure; strength properties of concrete; modulus of rupture of concrete; plastic flow and stress release under sustained loads and variable conditions of moisture; miscellaneous concrete tests, including abrasion resistance; slipperiness (of pavements); needed research in aggregates, including flat and elongated pieces, deleterious materials, soundness tests, relationship between durability of aggregate and such properties as pore size and pore volume, absorption, percentage of saturation, and strength characteristics; aggregate gradation; physical characteristics of aggregates.

The mere listing of these sub-heads is enough to demonstrate the numerous variables in any research on concrete and doubtless accounts for the scarcity of definite and positive results in much research over many years. However, Mr. Goldbeck ended in an optimistic paragraph: "In view of the researches needed in the concrete field, one might gain the impression that concrete is a very imperfect material which will require a lot of research to make it entirely satisfactory, but such is not the case. In general, concrete is doing an excellent piece of work as a structural material, a fact which has been brought about by the tremendous amount of research work which has been performed in past years. But concrete technicians have ever been on the alert to improve their product, if only to a slight extent."

Conclusions

From our own point of view, based on this and the previous papers mentioned, we believe that the best of all future research on concrete will be that on the physico-chemical properties of the material—crystal structure, if there is one, character and strength of the bonds in the structure, etc. — rather than that on experiments to determine ways by which concrete specimens can be destroyed in laboratory experiments. Probably the tremendous, fast-accumulating test data of the latter kind will prove helpful in establishing some really fundamental concepts, but someone, as Messrs. Powers and Steinour have done, must make logical and analytical study of the whole problem of durability of concrete with respect to all its characteristics. There have been too many conclusions drawn from limited experimental data that may or may not simulate conditions to be met in Nature.

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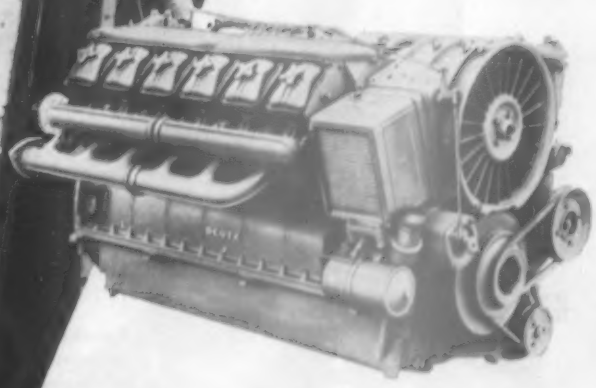

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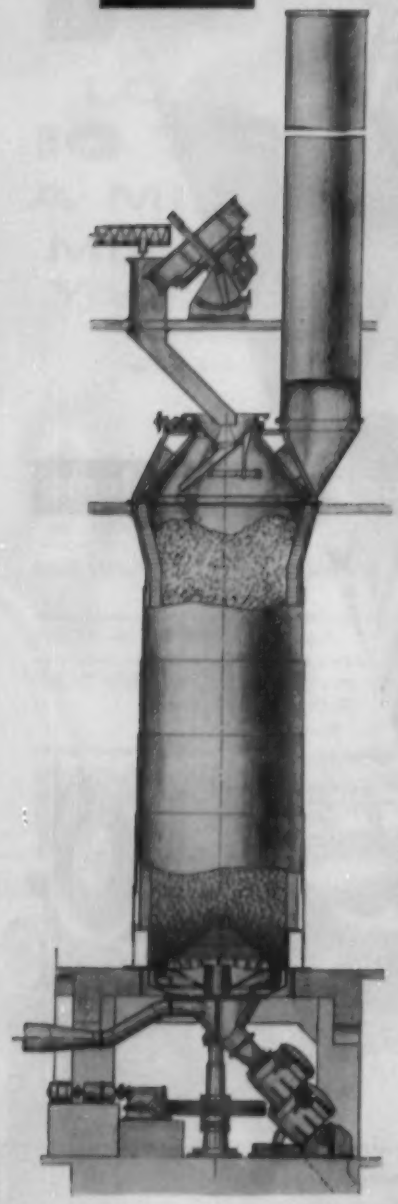

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Labor Relations

(Continued from page 29)

ble time for all time worked on any hours on a holiday. If the time worked was less than the holiday pay the difference was paid in holiday pay. All hours are treated exactly the same, regardless of time. In 1953 and 1954, in eight different cases, shop employes worked after 4:30 p.m. on holidays, and were paid double time for the hours worked—the balance made up at straight time if they worked less than eight hours.

"The two men, parties to this grievance, were not scheduled to work on Armistice Day. They were called to work on kiln breakdowns, and were paid double time for the 6½ hr. they worked, and straight time for 1½ hr. Since 1952 no question has been raised of this nature until the instant case. Section 2 of the contract sets up the premium pay provisions and spells out the time when time-and-one-half is to be paid and when double time is to be paid. Section 3 specifically provides that double time shall be paid for all time worked on designated holidays with no specification what hours are to be worked. The use of the words 'all time worked' leaves no doubt that there is but one pay rate for work on the holiday regardless of when it is performed. The language used has been in effect since 1952, and if the parties intended change they would have asked for it during the negotiating sessions. This in reference to the provision 'double time for all time worked on the holidays.' There are no specified hours of work for the shop employes with the exception of one man.

"It is the company's interpretation that the contract provisions are specific; that where you have a specific reference to double time to be paid for all hours worked on the holidays other general provisions must give way. In this case the contract provisions are specific, both in Section 2 and Section 3.

Comments by Arbiter

"The union's witnesses testified that at the wage negotiations the subject of holiday and premium pay was discussed, but that the specific hours each should apply was not discussed. All of them agreed that their understanding and interpretation of the holiday pay provisions was as follows: the recognized starting and closing time of the shopmen (machinists and electricians) was 8:00 a.m. and 4:30 p.m. At 4:30 p.m. on a designated holiday they would have earned their vacation pay—the straight time rate for eight hours though they had not worked, as

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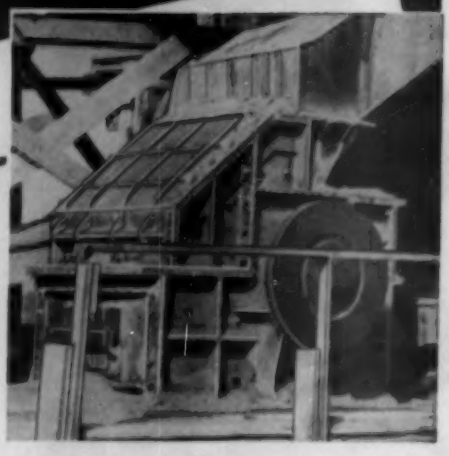

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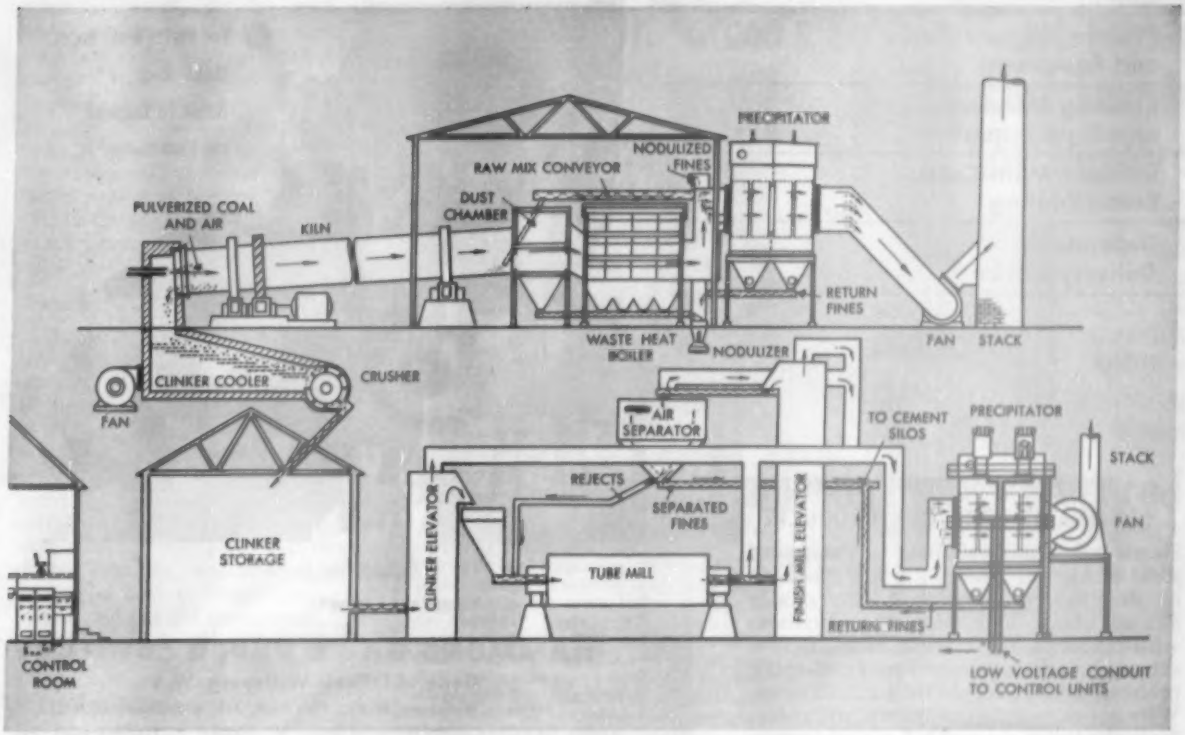
per contract provisions governing holiday pay. If they worked the holiday shift from 8:00 a.m. to 4:30 p.m. they would be entitled to straight time plus premium pay, or double time for eight hours worked. They contend it was never the intent of the contract that a man could be called after 4:30 p.m. —perhaps in the middle of the night— and work for straight time, which, eight hours holiday straight time having already been earned, they would actually be doing if the employer's interpretation was applied. They stated that cases of this kind, if previously arisen, had never been called to the union's attention; and certainly would have been processed as grievances if they had.

"The company representatives testified that except for one shop man regularly assigned to a shift on holidays, there were no scheduled work hours for shop men. They stated that since 1952 there had been eight instances where men were called to work after 4:30 p.m. on a holiday and paid double time, the straight-time holiday pay plus premium pay for the hours actually worked, straight time only for the time not less than eight hours; that no complaint had been made on any of these instances. The company in the instant case paid double time for the 6½ hr. worked, and straight time for the 1½ hr. not worked, completing the eight hour shift period. The company virtually rests its case on two factors: (1) the absence of any designated shift hours on holidays to any except one mechanic; (2) the provisions in the contract which state unequivocally that double time shall be paid for all time worked on the above designated paid holidays.

"Your arbitrator recognizes some force to the union argument that it was never intended that men should work — perhaps all night — without penalty pay in addition to the holiday and premium pay provided. Many contracts recognize the hazard inherent in working unseasonable hours by providing shift pay differentials. But your arbitrator is forced to construe the contract literally as it reads. To provide the interpretation the union demands the contract should read that before or after the hours of 8:00 a.m. and 4:30 p.m. time worked on a designated holiday shall be paid double time plus straight time for the hours so worked. The contract does not so read. Your arbitrator finds specific language in Sec. 2, Art. 14, and Sec. 3 (c), Art. 14, providing double time for *all* time worked on a designated holiday. He admits that there may be established practice in some

(Continued on page 113)



How dust collecting problems are handled in the modern cement plant

The "why" of the Cottrell precipitator is well known to cement plant personnel—its use in nuisance abatement and cement dust salvage is well established. These diagrams explain the "how" of the Cottrell, including its familiar application to kiln gas and, more recently, its use in the ventilating system of the finishing mill.

Kiln Gas

The upper half of the drawing shows a Cottrell for cleaning kiln gases. They are first passed through a dust chamber to the waste heat boiler and from there to the electrical precipitator, where the dust is removed. Salvaged dust is returned by conveyor to the process. The cleaned gas is discharged to the atmosphere through an induced draft fan and the stack. (Wet process kilns may also be fitted with Cottrells).

And In The Finish Mill

Dust from the grinding mills has always been a major problem. The lower half of the diagram shows the recent application of the Cottrell for cleaning finish mill ventilating system gases. Cement dust is collected from the ventilating system serving the separators, conveyors and elevators. As before, recovered dust is returned to the process.

Separating Small From Large Particles

When large particles of low alkali content must be separated from very small particles of high alkali content, an integrated mechanical-electrical precipitator will do the job effectively. The mechanical element handles large particles, and the electrical element collects the smaller particles that escape it.

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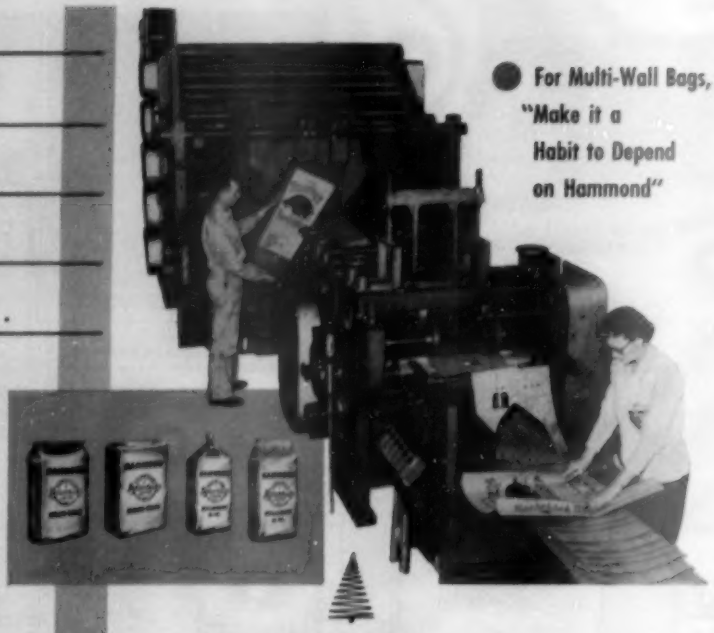

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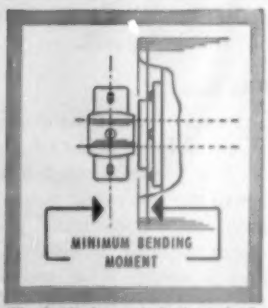

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other concerns employing such mechanics in line with the contention of the union in this instance. Even though that be true, it cannot change the implication contained in the plain language in this contract. Your arbitrator must be confined in his thinking to the testimony, oral and written, directly presented to him. He submits that in this instance the weight of evidence presented is on the side of the employer.

Award

"It is the finding and award of your arbitrator that the contract provides the payment of double time only for all time actually worked on a designated holiday, regardless of the time the work began and closed. If no work is performed on said holiday, 8 hr. pay at straight time shall have been earned; if part of a shift shall have been worked, that part shall receive double time, the remainder of an 8-hr. period paid at straight time. The award confirms the correctness of the company's interpretation and compensation paid in the case at issue."

Increase Efficiency In Hydration of Lime

IN THE ARTICLES by the above title by N.V.S. Knibbs and E. G. S. Thyer that appeared in the June and July issues of ROCK PRODUCTS, proper recognition was not given to the development by Corson of the first instantly plastic pressure hydrated lime and the Corson patents.

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New Gypsum Quarry

(Continued from page 82)

dumper. A belt conveyor then transfers the rock to a shuttle belt serving a 500-ft. long, 200-ft. wide and 90-ft. high stockpile. Storage capacity is as much as 200,000 tons — enough for two months shipping at three 10,000-ton ships a week. A 60-in. tunnel belt conveyor carries the gypsum to the dock, where it is elevated to the ship loader.

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Three 15,000-ton cargo ships are now being built for National Gypsum in Germany. The first is scheduled for delivery later this year and the two others next year. Presently, 10,000-ton leased ships handle ocean deliveries.

Depreciation Allowances

THE JAEGER MACHINE CO., Columbus, Ohio, has published a booklet, "New Depreciation Methods for Contractors," which reviews and clarifies the liberalized methods of depreciation provided for in the 1954 Internal Revenue Code. Although prepared for contractors, the book is applicable to the rock products industries. It describes and compares the accepted methods for taking depreciation on new equipment purchased or put to use after December 31, 1953, with a useful life of three years or more. These include the straight line method, declining balance method, and sum of the years digits method. The booklet also describes methods for reinvestment of capital, which allow the producer to own modern equipment without using additional cash for capital investment.

Ponce Mill Approved

PONCE CEMENT CORP., Puerto Rico, has been granted permission by the Broward County Port Authority to build a cement clinker grinding mill at Port Everglades, Fla. A 10-year lease calling for a $12,500 annual rental will be submitted to the Ponce firm for approval. Because of strong local opposition to the mill, court action may forestall construction.

STANDS UP TO SEVERE USE
and even abuse

One word describes a Hayward —*ruggedness*. Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church St., New York 7, N. Y.

HAYWARD BUCKETS

CLAM SHELL · ELECTRIC · ORANGE PEEL · GRAPPLES

famous for performance since 1888

KEEP ABREAST WITH INDUSTRY TRENDS THROUGH ROCK PRODUCTS

Mixer Blade Life Increased 19 Times *by* **Hard-Facing**

Blades hard-faced with HAYSTELLITE tungsten carbide rod have been in operation for 20 months—and are still in good condition. They have mixed 36,000 cubic yards of concrete while operating 3 shifts a day, 6 days a week. Unprotected cast steel blades had to be replaced every 4 to 5 weeks while operating under the same conditions. More than 19 shutdowns have been eliminated by hard-facing, and repair and replacement costs have been cut sharply.

Big savings like this are not unusual when HAYNES hard-facing products are used to prolong the life of equipment. These wear-resistant materials give outstanding service when used to protect conveyor screws, buckets, crushers, tractors, and other equipment exposed to abrasion, corrosion, impact, or heat.

Your local dealer carries a complete line of HAYNES hard-facing alloys, including HAYNES iron and nickel-base rods, HAYNES STELLITE cobalt base rods, and HAYSTELLITE tungsten carbide tube rod. Ask him for descriptive literature. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana.

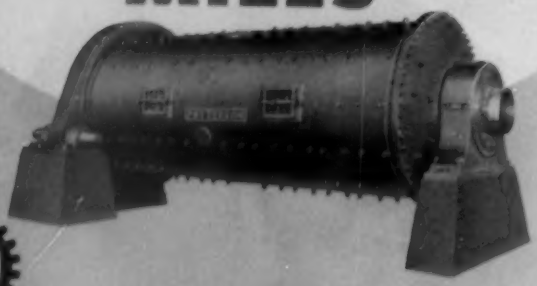
See... | **Your local Haynes Stellite Dealer**

or

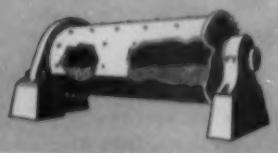
Write... | **to Haynes Stellite Company**

"Haynes," "Haynes Stellite," and "Haystellite" are registered trade-marks of Union Carbide and Carbon Corporation.

LOW COST
CONTINUOUS
GRINDING
WITH
Patterson
MILLS

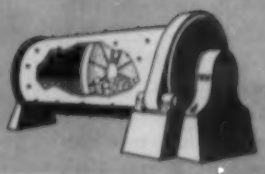


These smoothly performing Continuous Mills are most economical and efficient grinders. They are adaptable to fine or coarse grinding . . . wet or dry grinding . . . open or closed circuit grinding. Send for Patterson Catalog No. 534.



BALL AND TUBE MILLS

Standard Heavy Duty Ball or Tube Mill has replaceable cast alloy iron or steel lining . . . or may be lined with POROX (porcelain) for light duty applications.



COMPARTMENT TUBE MILLS

Separate compartments are charged with different size grinding balls. Compartments operate as several mills in series.

HEAVY DUTY CONTINUOUS ROD MILLS

Particularly desirable when a relatively coarse product with a minimum amount of fines is desired.

Ask for recommendation on the proper mill for your specific need.

The Patterson Foundry and Machine Company
East Liverpool, Ohio, U. S. A.
NEW YORK, BOSTON, BALTIMORE, PHILADELPHIA, PITTSBURGH, DETROIT, CINCINNATI, ATLANTA, CHICAGO, ST. LOUIS, HOUSTON, DENVER, LOS ANGELES, SAN FRANCISCO, SEATTLE

The Patterson Foundry and Machine Company, (Canada) Limited
Toronto, Canada
MONTREAL

Lime Putty Plant

(Continued from page 80)

charge end to the aging vats by a self-priming, positive displacement, pump. Close supervision is exercised through the entire slaking operation to see that the proper temperature range is at all times maintained to provide putty of the highest quality.

As lime solids in a cubic foot of lime putty will show a considerable variation between the period of initial slaking and the time it is properly ready for use, the putty in the storage vats is checked prior to its use to determine the percentage of lime solids per cubic foot, thus enabling the company to certify to the architects and builders that when the specifications call for a fixed percentage of lime solids, they are receiving exactly that, and not water.

The problem of sand requirements to produce lime mortar of the greatest density and workability with a minimum of segregation has been given intensive study. The sand in Masco certified mortar is prepared to the Mason Supply Co.'s own specifications. That this problem has been solved is evidenced by the fact that in deliveries up to 30 miles, no segregation or water gain is discernible. It is hauled to the plant by trucks, dumped, and then elevated by power to a huge steel storage tank that dominates the plant. From this tank it is conveyed by means of a screw with a fixed uniform capacity to the mixer.

With the continuous type mixer, the sand is fed in at the intake in a constant volume. The lime putty is injected at this point through a unique pump with a pushing action which provides a uniform discharge without pulsation, thus insuring a metered, uniform, flow. The speed of this flow is controlled to an extremely fine tolerance by means of a variable speed control on the pump motor. The control itself is at the fingertips of the plant operator, making it possible to adjust the quantity of putty instantly to meet any special condition that may arise. An interesting feature of this type of control is that the question of proper measurement is no longer an "eye-ball" judgment of the plant operator but rather an accurate scientific measurement.

The flow of materials and the mixing operation is so accurately calibrated that time is actually substituted for volume as the standard of measurement. At the expiration of the time necessary to insure the accurate delivery of the required quantity, the warning signal sounds and the press of a button brings the combined mixing and loading operation to an end.

Most Modern Design!
Most Modern Power!

Get both in new Chevrolet Task-Force trucks. Modern styling that actually works for you! Modern power in the shortest stroke V8's* in any leading truck!

Styling that's designed to make money for you—It's a fact. The ultra-modern, Powermatic design of a new Chevrolet Task-Force truck calls attention to your business, favorably impresses customers and prospective customers! That's why on looks alone a Task-Force truck can make money for you. And it's *functional* styling. Panoramic windshield, new High-Level ventilation, concealed Safety Steps—these are styling features that double in brass to make the driver's job less of a chore. With safety and comfort increased, efficiency goes up. Tight schedules are easier to maintain and you keep the profits coming in on time.

V8 power—unmatched for efficiency!—Chevrolet brings you the industry's most advanced short-stroke V8 engines! The compact, super-efficient design of these great V8's reduces friction and wear . . . delivers a higher output per pound of engine weight. You save on upkeep and operating costs! And with a modern 12-volt electrical system, you get double the voltage for quicker starting plus a greater reserve of electrical power. *With two power-packed V8's and five gas-saving 6's—it's the greatest engine choice in Chevrolet truck history!* See your Chevrolet dealer for details. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

**V8 standard in the new L.C.F. models, an extra-cost option in all others except Forward-Control models.*

NEW CHEVROLET *Task-Force* TRUCKS

CHEVROLET

the pit: *tough...* 70% ROCK 30% SAND

the machine: Sauerman 2½-cu. yd. slackline cableway excavator

the result:

"*..a full bucket every trip*"

Another actual field report—Helena Sand & Gravel Co., of Helena, Montana, switched to this Sauerman equipment in 1946. It's been in operation since then . . . successfully performing difficult underwater excavation of rock and colloidal sand where other equipment had failed.

Sauerman Slackline Cableways span water, bogs or pits . . . reach far, dig deep, lift and carry loads to hoppers or cone piles. However tough the pit, Sauerman equipment brings in a good load every trip.

With a Sauerman Slackline Cableway, one man—in safe position—operates a single machine . . . does the complete job, quickly, efficiently, economically! Sauerman Slackline Cableways range from ⅓ to 3½ cu. yds.—span distances up to 1,000 feet . . . handle such materials as sand, gravel, clay, peat, ore and rock.

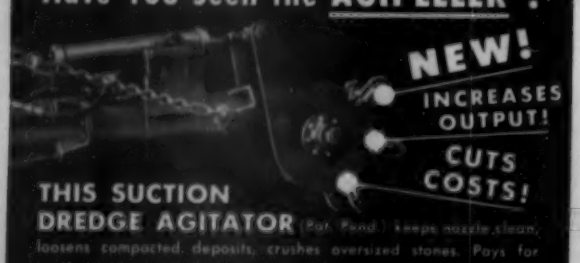
Write today for more information, including these handy field reports and catalog:

FR-213	Cleaning Ponds Without Draining
FR-216	Easy Excavating in a Tough Pit
FR-102	Digging Gravel From a River
Catalog C	Sauerman Slackline Cableways

SAUERMAN BROS. INC.

630 S. 28th Ave. | Bellwood, Ill.

Have You Seen the AGIPELLER®?



THIS SUCTION DREDGE AGITATOR (Pat. Pend.) keeps nozzle clean, loosens compacted deposits, crushes oversized stones. Pays for itself quickly. Write for free bulletin. *Trade mark

W. H. PFARRER CO., 211A W. Wacker Dr., Chicago, Ill.
Dredge and Pump Engineers

ROCK PRODUCTS FEATURES TIMELY INDUSTRY NEWS EACH ISSUE

MANUFACTURERS NEWS

The White Motor Co., Cleveland, Ohio, has announced the appointment of P. E. Tobin as general sales manager of the truck division. He succeeds J. N. Bauman, who was recently elected executive vice-president of the company. Born in Middletown, Ohio, Mr. Tobin was graduated from Indiana University, Bloomington, Ind. He joined White Motor Co. in 1941 and one year later was appointed North Atlantic regional manager in New York City. Previously he was associated with B. F. Goodrich Co. in personnel work and in sales.

P. E. Tobin

Fuller Co., Catasauqua, Penn., as a result of its recent affiliation with General American Transportation Corp., is expanding and diversifying use of its pneumatic conveying systems, rotary air compressors and vacuum pumps, coolers and preheaters into new processing fields. It is predicted that more than 1000 Airslide cars, using the same principle as its Airslide systems for the industry, will be in operation on railroads by the end of 1955. Foundry and machine shops at Manheim are being expanded and modernized in addition to the new engineering building constructed in 1954.

Fuller Co. has been closely associated with the cement industry in the Lehigh district of Pennsylvania and throughout the world since it was organized in 1926, the cement industry accounting for more than one-third of its total business.

George Kemp Engelhart, sales vice-president, was master of ceremonies at the recent 3-day sales meeting and introduced the following speakers and guests: Spencer D. Moseley, assistant to the president, General American Transportation Corp.; M. I. MacTaggart, Kandos Cement Co. Ltd., Australia; Fred A. Weibel, president, Allentown Portland Cement Co.; C. Cassard Kaesemeyer, general sales manager, Fuller Co.; Joseph H. Morrow, vice-president-engineering; and Channing O. Davis, vice-president-manufacturing. More than 100 Fuller sales engineers from all over the United States, Canada and Mexico attended the meeting.

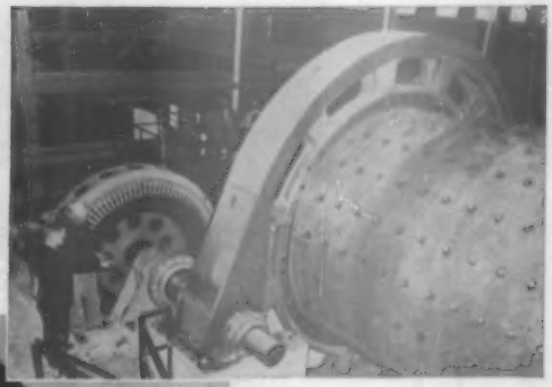
Koehring Co., Milwaukee, Wis., announces that E. B. Hill has been appointed assistant to the president. He was formerly vice-president and director of sales, advertising and export sales for Gar Wood Industries, Inc. Howard H. Mobley has been named district representative for Illinois, Indiana, Tennessee, Arkansas, Mississippi, Missouri and Kentucky. William B. Thompson has been appointed district representative for California, Arizona, Utah and Nevada, with headquarters in San Francisco. R. E. Burton has been made assistant general sales manager to succeed M. O. Messenger who recently was named vice-president and sales manager for the Canadian subsidiary, Koehring-Waterous Ltd.

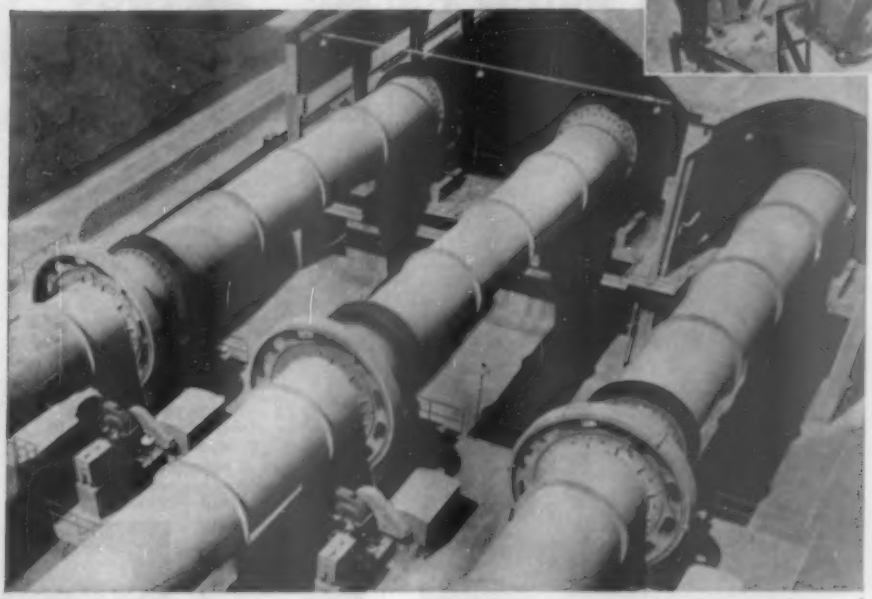
Galion Allsteel Body Co., Galion, Ohio, has appointed the Miami Valley Truck Body & Equipment Co., Dayton, Ohio, as distributor in west central Ohio, and the Atlas Truck Equipment & Bus Co., Milwaukee, Wis., in Wisconsin and the Upper Peninsula of Michigan.

Hercules Steel Products Corp. and Central Ohio Steel Products Co., Galion, Ohio, have merged, and the new company will be known as Hercules Galion Products, Inc., with a working capital of approximately $4 million.

FALK

Modern Gears for Modern Needs





ABOVE: A 10 ½' x 12' ball mill with Falk helical gear and Steelflex coupling.

LEFT: 10' x 340' rotary kilns driven by Falk single helical gears, reducers and Steelflex couplings.

Are your costly gears wearing out? Falk Helical Gears wear in!

Operators and engineers know that the action of ever-present abrasive particles on gear teeth is the arch-enemy of gear performance and gear life. They know that, when spur gears are used, abrasion tends to damage the tooth profile (thus lessening the smoothness of power transmission)—and ultimately destroy the gear teeth.

The sure way to reduce costly gear damage to an absolute minimum is to use Falk Precision-Hobbed Helical Gears. On these, the gear teeth are on a helix; this means that all phases of profile contact ("rolling" and "sliding") exist at the same instant. Pressure and abrasive wear on "sliding" tooth surfaces are reduced, smooth transmission of power is assured, and *the life of gears and connected machinery is extended.* With several teeth sharing the load at all times, the teeth actually wear themselves *in,* instead of *out!*

You will find long-range economy in specifying "Gears by Falk" whenever you expand or revamp your facilities. Falk is *the manufacturer* best prepared to recommend and produce the exact helical gear—single or herringbone type—most suited to your application. Falk's leadership in precision gearing is recognized the world over.

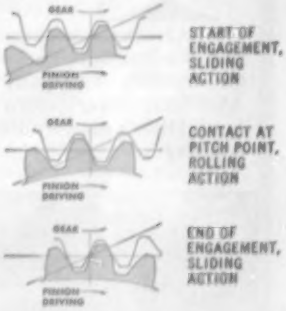
Consult the Falk representative nearest you—
also, **write for Report 6170,** "Advantages of Helical Gearing."

THE FALK CORPORATION, 3001 WEST CANAL ST., MILWAUKEE 8, WISCONSIN

GEAR FACTS FOR ENGINEERS

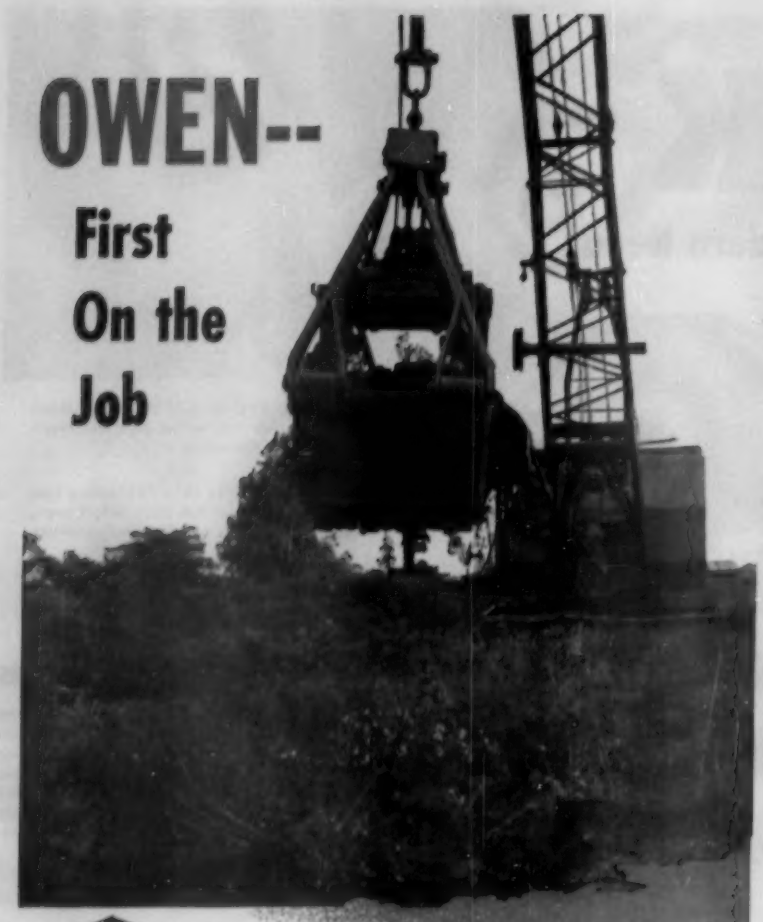
As each spur gear tooth picks up the full load, the relative motion between the driving and driven tooth is a sliding action. As rotation continues, this motion becomes rolling at the pitch point, changing to sliding action again as the tooth advances toward disengagement.

PHASES OF INVOLUTE GEAR TOOTH ACTION



Helical gears have several teeth sharing the load. Teeth are simultaneously in all phases of contact across profiles, with contact starting at the tip of the teeth and extending obliquely to the base, thus reducing unit pressures. Also, portions which are rolling will limit the pressure exerted on portions which are going through sliding.

When abrasive materials contaminate the lubricant and get into the gear mesh, the more one can limit pressures in sliding areas, the less grinding action (hence wearing away) there will be.



An Owen bucket takes the first bite for National Engineering & Contracting Company on the 55th Street intersection of Cleveland, Ohio's multi-million dollar freeway.

One of their many Owen buckets breaks ground for the Horwitz Co. of Cleveland, Ohio at the opening ceremonies of Ohio's 241 mile, 326 million dollar turnpike at Peninsula, Ohio.

Yes, Owen buckets are first on the job—and first in demand for those who want greater digging power, quicker opening action, and more rugged construction.

Write today for free illustrated catalog.

THE OWEN BUCKET CO.

6040 Breakwater Avenue Cleveland 2, Ohio

Branches: New York, Philadelphia, Chicago, Bethelehem, Joliet, Fort Lauderdale, Fla.

Officers of the new company are David Van Alstyne, Jr., chairman of the board; E. Paul Monroe, president; Oliver C. Henkel, senior vice-president; Alfred Dangler, Jr., executive vice-president; and J. Robert Melish, secretary-treasurer.

Harnischfeger Corp., Milwaukee, Wis., announces that Frank Blum has been appointed general sales manager of the P&H industrial division in addition to his duties as sales manager of the overhead crane division. He has also been elected a member of the executive committee of the corporation. Mr. Blum has been associated with Harnischfeger since 1929 and has been sales manager of the overhead crane division since 1942.

Frank Blum

United States Rubber Co., New York, N. Y., has announced the appointment of Robert H. Bowman as district manager in New York. He was formerly district manager at San Francisco and will be succeeded by Arthur C. Tharp, formerly sales manager for the Milwaukee district. Osmond S. True has been made manager of the Boston district; Elmer G. Morrill, district manager of the Denver branch; W. T. Pearl, assistant district manager in Kansas City, and D. C. Lee, assistant district manager in New Orleans.

Link-Belt Speeder Corp., Chicago, Ill., announces that C. M. Basile has been appointed vice-president of manufacturing and sales, and Gordon W. Rowand has been promoted to sales manager. Both men will make their headquarters at Cedar Rapids, Iowa. Mr. Basile has been vice-president in charge of operations at Link-Belt Speeder since 1950. Previously, he had been with Link-Belt Co., the parent firm. Mr. Rowand joined Link-Belt Speeder in 1946 and has served as assistant sales manager since 1953.

C. M. Basile

G. W. Rowand

Gilman Paper Co., New York, N. Y., announces that F. L. Munger, formerly assistant to the vice-president in charge of sales, has been promoted to vice-president and sales manager of the Kraft Bag Corp. Larry K. Norton has been appointed assistant vice-president and sales manager of the standard products division, and Homer Lake has been named assistant vice-president and sales manager of bleached and unbleached pulp and specialty papers.

Nordberg Mfg. Co., Milwaukee, Wis., has appointed the following distributors: Lively Equipment Co., El Paso, Texas, and Albuquerque, N. M., in New Mexico, the El Paso area and northeastern Arizona, and the Tractor & Equipment Co., Sidney, Mont., in the eastern third of Montana and the western quarter of North Dakota.

"Quick-Way" Truck Shovel Co., Denver, Colo., announces the appointment of Kenneth O. Williamson as assistant general manager. He was formerly sales manager of Marion-

Three completely New PAYLOADER® tractor-shovels with new "more-yardage" features

POWERFUL PRY-OUT ACTION

Tremendous pry-out force is obtained by using the breakout pads on the ground as a fulcrum for leverage. The load forces opposing the pry-out action are thus transferred to the ground through the pads instead of to the axle, wheels and hydraulic system of the machine.

model HU 1 cu. yd.

40° BREAK-OUT at ground level

You can get HEAPED BUCKET LOADS and you get them FASTER and EASIER WITH THIS NEW BUCKET ACTION. Most important of all — you KEEP BIGGER PAYLOADS—because the bucket can be tipped back a full 40 degrees at ground level before it is raised, eliminating spillage.

model HH 1½ cu. yd.

SAFETY and STABILITY

Special boom-arm shape and positioning keeps moving members out of operator's reach at all positions. Close, low, load-carry position and longer wheelbase provide stability and balance for fast maneuvering — with safety.

model HO 2 cu. yd.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

These three all-wheel-drive "PAYLOADER" units are outstanding examples of Hough's continuing pioneering and leadership in tractor-shovel design. They have more digging power, get big bucket loads easier, can carry them faster and safer.

They are full of other features and improvements that boost output, operator comfort and safety and that lower the cost of digging, scooping-up, loading, moving and piling earth and bulk-materials.

Your "PAYLOADER" Distributor is ready to demonstrate these new units and what they can do — for you.

HOUGH-DESIGN HOUGH-QUALITY

More Horsepower per bucket capacity than any other standard models. Either diesel or gasoline engines available.

Easy to Operate Fullest operator visibility for safe, fast maneuvering; power steering; powerful hydraulic brakes; adjustable seat with molded foam-rubber cushions.

Powerful Transmissions Powershift transmission is standard equipment on the big model HO; four-speed full-reversing types on model HH and HU. Torque converter drives are standard equipment on all models — multiply engine torque up to 350% — act as shock absorbers for the entire power train.

THE FRANK G. HOUGH CO.
705 Sunnyside Ave. Libertyville, Illinois

Send full information on new "PAYLOADER" Tractor-Shovels

- ☐ Model HU 1 cu. yd.
- ☐ Model HH 1½ cu. yd.
- ☐ Model HO 2 cu. yd.

Name .....
Title .....
Company .....
Street .....
City .....
State .....

UNRETOUCHED

...the "daddy" of them all!

BUCKET TOOTH REPOINTED WITH

MANGANAL

Trade Mark Reg. U. S. Pat. Off.

11%-13½% MANGANESE-NICKEL STEEL

WEDGE BARS

21 Times

. . . at about 1/3 the cost of a new tooth each time!

A Messabi Iron Range open pit mine has found the way to keep its bucket teeth working longer.

The tooth illustrated has just been repointed for the 21st time; Seaco Hard-Surfacing Electrodes protect tip of wedge bar while workhardening. Manganal Wedge Bar was attached with Manganal Bare Electrodes for greater strength.

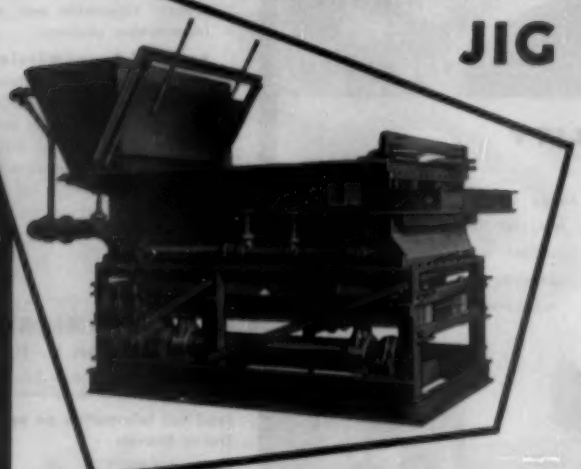
Next time your bucket teeth need repointing, try Manganal Wedge Bars and Electrodes, and Seaco Hard-Surfacing Electrodes.

STOODY-SICKLES CO.

SOLE PRODUCERS 92 N. J. RAILROAD AVE. NEWARK, N. J.

NEAREST DISTRIBUTOR UPON REQUEST

THE MECKUM SAND AND GRAVEL JIG



REMOVES

WOOD
LIGNITE
OCHRE
SHALE
POROUS STONE
SOFT STONE
COAL
CHERT
CLAY

Improve your sand or gravel specifications at a low cost per ton. Of compact design, the Meckum Jig separates low from high specific gravity materials with a positive water and mechanical action.

Write us for details or nearest installation.

MECKUM ENGINEERING, INC.

53 W. Jackson Blvd., Chicago 4, Ill. Dayton Road, Ottawa, Ill.

Osgood-General. **Daniel S. Heffron** has been promoted from sales manager to director of domestic and export sales. Walter O. Lampl has been appointed production coordinator, and William Roeschen, industrial engineer.

The Heil Co., Milwaukee, Wis., has appointed the following distributors: Alabama Truck Equipment Co., Birmingham, Ala., in the northern counties of Alabama; Johnson Trailer & Equipment Co., Macon, Ga., in the state of Georgia bounded on the north by and including the counties of Troup, Meriwether, Pike, Lamar, Butts, Jasper, Putnam, Hancock; bounded on the east by and including the counties of Washington, Johnson, Treutlen, Wheeler and Telfair; and bounded on the south by and including the counties of Stewart, Webster, Sumter, Crisp and Wilcox; and the Capitol Trailer & Equipment Co., Montgomery, Ala., in southern Alabama.

Clark Equipment Co., Benton Harbor, Mich., has appointed the following distibutors for the construction machinery division: Stephens Equipment Co., Des Moines, Iowa, for central Iowa; B. E. Common Equipment Co., Peoria, Ill., for west-central Illinois; Machinery Outlet, Inc., Wichita, Kan., for central and western Kansas; Totem Equipment Co., Seattle, Wash., for Washington (except five southwest counties) and northern Idaho; West Virginia Tractor & Equipment Co., Charlestown, W. Va., for West Virginia with the exception of counties of Marshall, Ohio, Brooke, Hancock, Morgan, Berkeley and Jefferson; and Barker Equipment Co., Fredericton, N. B., Canada, for the province of New Bunswick.

Hudson Pulp & Paper Corp., New York, N.Y., has acquired the multiwall bag manufacturing business of Hammond Bag & Paper Co., Wellsburg, W. Va., in exchange for shares of Class A common stock of Hudson. It was announced that the Hammond company will operate as a separate division with the same executive sales and employe personnel and that sales operations and services will continue to be conducted under the Hammond name.

Hyster Co., Portland, Ore., has announced the appointment of Miller Equipment Co., as distributor in western Michigan covering the lower peninsula north and west of and including counties of Emmet, Charlevoix, Otsego, Crawford, Roscommon, Clare, Isabella, Gratiot, Clinton, Ingham, Jackson, Branch, St. Joseph, Cass and Berrien. J. P. Waite, Inc., will continue to serve the western portion of the state on the northern peninsula.

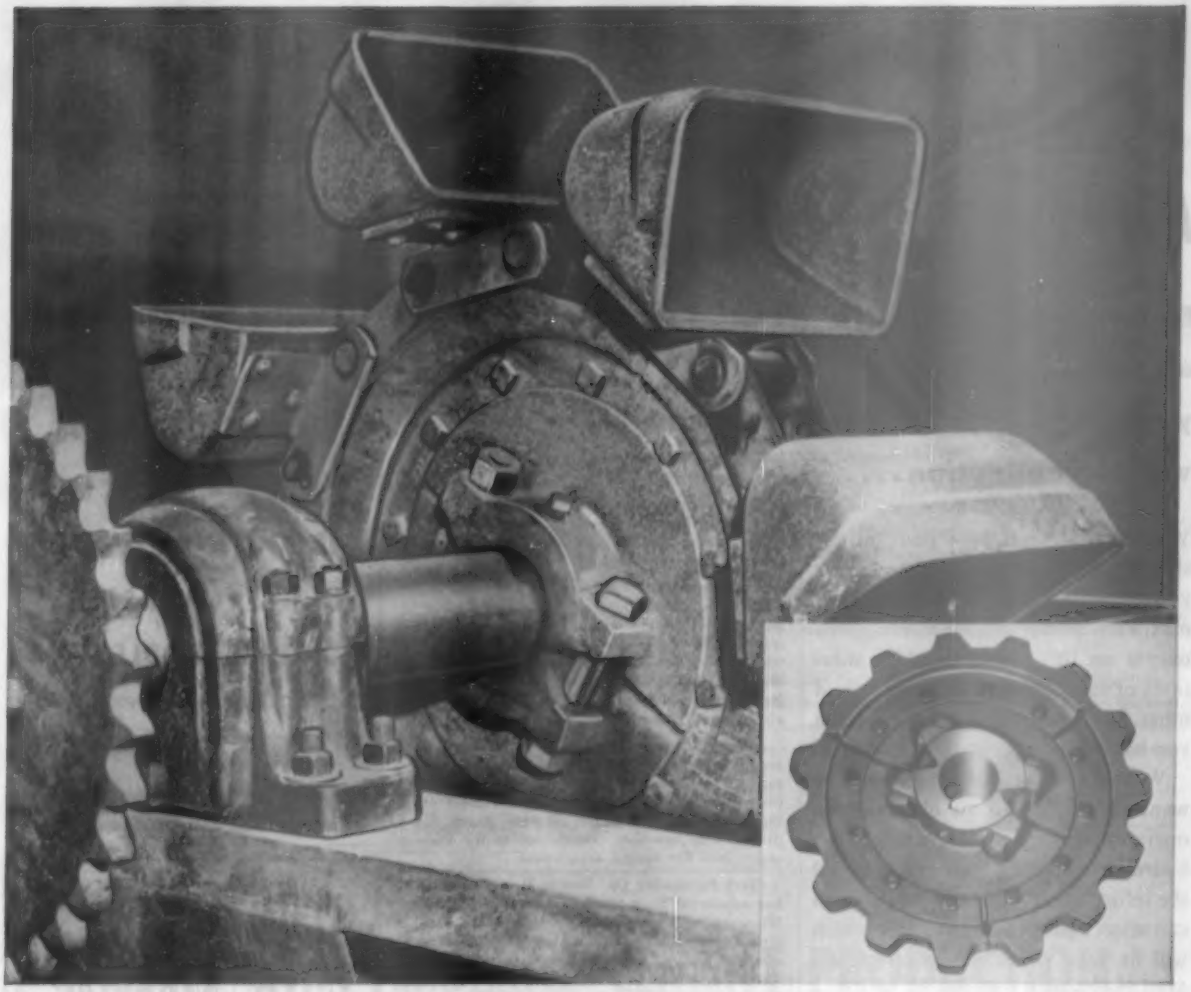
Simplicity Engineering Co., Durand, Mich., has announced a new Canadian subsidiary, Simplicity Materials Handling Ltd., Guelph, Ontario. E. L. A. Whitaker, formerly industrial commissioner for the City of Guelph, has been appointed general manager.

American Hoist & Derrick Co., St. Paul, Minn., has announced acquisition of the Thomas Laughlin Co., Portland, Me., which will be operated as the Thomas Laughlin division of the company.

Aluminum Industries, Inc., Cincinnati, Ohio, has announced the appointment of Erwin C. Laudt as sales engineer east of the Rocky Mountains for the Permite concrete curing compound division, and Permite N-Tair, new air-entraining agent for concrete.

John A. Roebling's Sons Corp., Trenton, N. J., has appointed Charles E. Meluney, Jr., as Houston district sales manager for the electrical wire and cable division, Oklahoma, Louisiana and Mississippi, and most of Texas.

Marion Power Shovel Co., Marion, Ohio, has announced the appointment of Walter Pierson as southeastern sales manager in South Carolina, Tennessee, Georgia, Florida, Alabama, Mississippi, Louisiana and Arkansas east of and including the counties of Miller, Little River,



DOWN Time Goes Down

with Rex Segmental Sprockets

For all your elevator bucket needs, call your Chain Belt Man or Distributor. A complete range of types and sizes.

For severe elevator service, Rex Chabelco® S-856 and S-858 Steel Chains will outlast any other chain. A complete range of chains and sprockets are also available.

With new Rex Segmental Sprockets and Traction Wheels, you can turn down time into productive time. It's this easy!

With this new idea in sprockets, you drastically reduce maintenance and down time. The sprocket hubs are split and the sprocket rim is bolted to it. You just slip the split hub around the shaft... tighten it... bolt on the rim. No need to remove bearings... shafts... or take down the chain. You're ready to run hours faster. Think of the saving in down time... in maintenance time. These sprockets virtually pay for themselves in savings.

When, after long, hard service, wear takes place on the rim sections, you just remove the rims and install new ones... you don't even have to remove chain from sprockets.

Write for your complete cost-cutting information on Rex® Segmental Sprockets and Traction Wheels. CHAIN Belt Company, 4649 W. Greenfield Avenue, Milwaukee 1, Wisconsin.

CHAIN BELT COMPANY

District Sales Offices and Distributors in all principal cities

FREE PUMP ANALYSIS

Experienced hydraulic engineers will figure your exact pump needs without obligation...

You'll learn what size your pump should be... its required capacity for your installation... minimum and maximum power requirements... its output on 10%, 15% and 25% solutions of sand, gravel and water... and other facts you need to know when you have to pump.

Whether you've just struck water or want an analysis of an old pumping operation makes no difference. Amsco® hydraulic engineers will give you all the information you need, so that you can select a proper pump... one which will fit your particular requirements. Mail the coupon today.

AMSCO DIVISION

AMERICAN Brake Shoe COMPANY

Chicago Heights, Ill.

Amsco Division (Pump Department)
Chicago Heights, Ill.

I want a free pump analysis without obligating myself in any way. Send information to:

Name_____

Company_____

Address_____

City_____ State_____

Sevier, Howard, Yell, Montgomery, Pike, Newton and Boone. Assisted by R. S. Rhoay, divisional sales manager, Atlanta, and R. L. Patience, district sales representative, Crescent City, Fla., Mr. Pierson will make his headquarters in Atlanta, Ga.

Edick Laboratories, Milwaukee, Wis., announces the appointment of E. M. Wakeman and Associates, Lakeland, Fla., as distributor for the states of Florida, Georgia and Alabama.

American Cyanamid Co., New York, N. Y., announces that John R. Burkett has been appointed assistant to the manager of the explosives department of the organic chemicals division. He was formerly business manager for dyestuffs and pigments of North American Cyanamid Ltd., Montreal, Canada.

Jay Mfg. Co., Pittsburgh, Penn., has announced the appointment of Donald L. Archibald as district sales manager in the New England area, with headquarters in Boston, Mass. He has been manager of the St. Louis office since 1951.

Cleaver-Brooks Co., Milwaukee, Wis., has announced the promotion of Elmer H. Wagner from general manager of manufacturing to vice-president of manufacturing.

Baughman Mfg. Co., Inc., Jerseyville, Ill., announces that Hugh Hudson, head of Hudson Sales Co., Riverside, Calif., has been appointed sales engineer for the West Coast division, which comprises Oregon, Washington, Idaho, Montana, Arizona, Wyoming, Colorado, Utah, Nevada and California, plus British Columbia and Alberta, Canada.

Joseph T. Ryerson & Son, Inc., Chicago, Ill., has announced that Gordon F. Witt has been named field representative for the tubular products and cold finished bar department at the Milwaukee plant. He succeeds Harry L. Sturis, who has been transferred to the Chicago plant for special assignment.

Clark Equipment Co., Benton Harbor, Mich., has appointed Mork-Witthauer Equipment Co., Minneapolis, Minn., as distributor for the construction machinery division in all Minnesota counties south of and including Traverse, Otter Tail, Becker, Mahnomen, Hubbard, Wadena, Morrison, Mille Lacs, Kanabec and Pine.

Chrysler Corp., Detroit, Mich., has established a regional office in Chicago, Ill., for the marine and industrial engine division, under the management of R. H. Procter, formerly West Coast divisional manager.

Huber-Warco Co., Marion, Ohio, has appointed the following distributors: Equipment Distributors, Inc., Charleston, W. Va.; The Gledhill Road Machinery Co., Galion, Ohio; Road Machinery, Inc., Devon, Penn.; and The O. S. Stapley Co., Phoenix, Ariz.

Traylor Engr. & Mfg. Co., Allentown, Penn., has announced the appointment of B. F. Witmer to its engineering staff. He was formerly manager of cement equipment sales for Vulcan Iron Works, Wilkes-Barre, Penn. Previously he was chief engineer for Allentown Portland Cement Co.

The Timken Roller Bearing Co., Canton, Ohio, has announced plans to construct a building for rock bit manufacture at its St. Thomas plant in Canada. It is estimated that production will start about September, 1955.

Blaw-Knox Co., Pittsburgh, Penn., has promoted A. H. Jackson from sales manager of the tower department, equipment division, to general manager of the new engineering and development department.

Borg-Warner Corp., Chicago, Ill., announces that its Ingersoll Kalamazoo (Mich.) division has acquired the Brooks Equipment & Mfg. Co., Knoxville, Tenn., which will be operated as a subsidiary of Borg-Warner.

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THE BEST IN SCREENING — AT THE LOWEST PRICE

THE MOST MODERN AND EFFICIENT ELECTRIC HEATING EQUIPMENT AT A REASONABLE PRICE

- VIBRATING SCREENS- *All sizes and types*
- UNILEC HEATING EQUIPMENT
- UNIFLEX VIBRATORS
- UNIVIBE RIDDLES

WRITE FOR CATALOG NO. 150

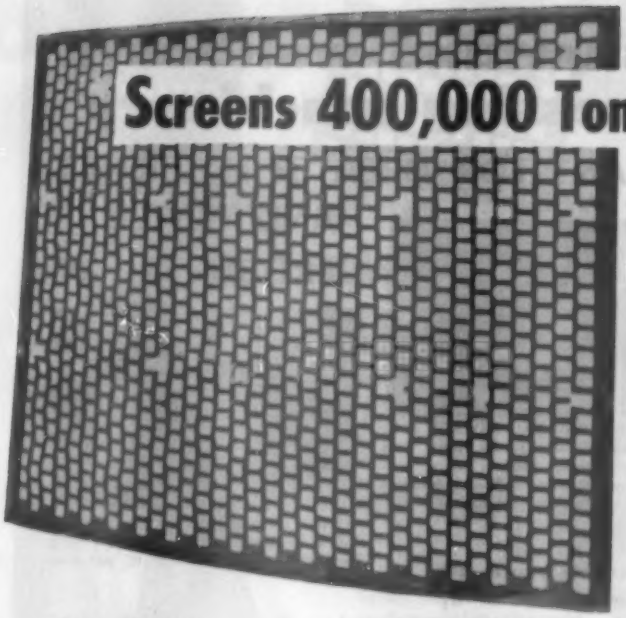
UNIVERSAL VIBRATING SCREEN CO.
Racine, Wisconsin
Quality Screens Since 1919

You're Sure with Merrick

FOR Positive Controlled Feed by Weight of Sand Gravel, Lime Clinker, Gypsum or other materials to Process—

Use the Feedoweight

Merrick Scale Mfg. Co.
Passaic, New Jersey



Screens 400,000 Tons of Petersburg Granite without a Mishap!

Here's another success story that typifies Hendrick's ability to manufacture Perforated Metal Screens that take the beatings of constant heavy-duty usage yet afford long service life:

PROBLEM: One of the Virginia quarries of Sunnyside Granite Co. had trouble screening hard "Petersburg Granite." The granite was so abrasive ordinary screens wore out quickly and had to be replaced.

SOLUTION: Hendrick manufactured a screen of ½" thick steel perforated with 1½" square holes. The screen was then heat-treated and double corrugated.

RESULT: Over 400,000 tons of Petersburg Granite passed over this one screen before it had to be replaced.

Hendrick
MANUFACTURING COMPANY
47 DUNDAFF STREET, CARBONDALE, PA.
Sales Offices in Principal Cities

Hendrick Perforated Plate used on vibrating and shaking screens can often mean the difference between profit and loss. To see how you can best benefit from Hendrick's long experience in manufacturing screens for the quarry industry, call your nearby representative today.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Wedge Wire • Architectural Grilles • Nitco Open Steel Flooring • Shur-Site Treads • Armorgrids

Increased* CEMENT PRODUCTION

BRADLEY HERCULES MILLS

The quickest, most economical way to increase your grinding capacity

For the cement manufacturer with excess kiln capacity . . . here is the answer to INCREASED CAPACITIES at an appreciable SAVING IN HORSEPOWER. The Bradley Hercules Mill, used as a preliminary pulverizer before compartment mills or tube mills, results in INCREASED PRODUCTION of finished material at a LOWER COST per barrel.

Rugged, dustless construction, maximum accessibility keep maintenance costs at an absolute minimum.

Automatic electrical feed control eliminates manual operation.

For complete information, write for Catalog No. 57

Bradley PULVERIZER CO.
LONDON ALLENTOWN, PENNA. BOSTON

EHRSAM gypsum and wallboard processing machinery

...WILL MODERNIZE YOUR PLANT FOR GREATER EFFICIENCY AND BETTER PRODUCTS

PAPER SECTION for board line paper is fed to board line with proper tension — giving a smooth surface to finished product.

FORMING ROLL SECTION — precision rolls run on anti-friction bearings — giving board a uniform thickness throughout.

MATERIAL STORAGE AND FEED — stucco bins with drag feeders store and transfer sufficient material for constant operation.

Ehrsam Lathe punch, can be furnished in Reciprocating or Rotary style with board speeds up to 300 ft. per min.

Ehrsam Calcining Kettle to reduce the raw gypsum to workable condition. Several sizes are available in gas or oil fired.

Ehrsam equipment will enable you to get the greatest returns from your plant by cutting maintenance and operating cost. Remember, if you are thinking of one machine or a complete plant, our staff of Engineers is available to you.

The J. B. EHRSAM & Sons Mfg. Co.
ENTERPRISE, KANSAS

"CROSS HEXCREEN"
A Honey of a Screen for
More Strength
More Capacity
and
Engineered Performance

Look for this stamp on all "Cross" Products

The Mark of PLUS QUALITY for PLUS PERFORMANCE

CROSS Perforated Steel Sections and Decks for VIBRATING — SHAKING — REVOLVING SCREENS

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MOST EFFICIENT BY ANY MEASURE FOR SINGLE OR MULTIPLE SPLITS!

COMPARE RESULTS . . . COMPARE COSTS . . . AGAINST ANY OTHER SAND GRADATION EQUIPMENT! AFTER SUCH COMPARISON, YOU, TOO, WILL BUY AUTO-VORTEX CLASSIFIERS . . . WHATEVER YOUR SPECIFICATIONS . . . WHATEVER YOUR PROBLEMS!

WRITE FOR OUR BULLETIN No. 81!

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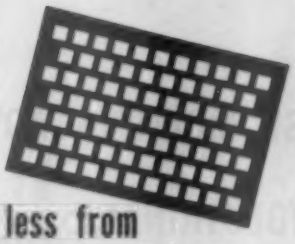
buy the best PERFORATED METAL SCREENS... for less from



STANDARD STAMPING'S NEW CATALOG

114 pages of full scale hole size and pattern illustrations make it easy to order Standard Stamping's Perforated Metal Screens, the screens that give you:

- greater accuracy
- more tonnage
- uniform hole size
- resistance to abrasion and fatigue
- no bending or distortion
- long range economy

Delivery from prime steel on hand, including special high carbon steels! For FREE catalog, attach this ad to your letterhead, or phone:

STANDARD

STAMPING & PERFORATING CO.

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Chicago 32, Ill.
HEmlock 4-0050

Furnishes a positive seal for round flexible joints. Used by leading dredging and hydraulic sand-and-gravel operators, and the U. S. Engineering Corps. This Multi-use chain sleeve clamp is easy to apply . . . positive in action. Write for illustrated folder, today.

THE BLACK BROTHERS CO., INC., 505 9th Ave., Mendota, Illinois

CUT CALCINING COST!

Calciner

2 of the 5 Ellernan Units Operating near Haifa, Israel.

CUT LABOR COST — The Ellernan Calciner's AUTOMATIC continous operation requires a minimum of labor.

CUT FUEL COST — Recirculation of heat ordinarily lost and automatic temperature control cut fuel costs by more than 30 percent.

CUT ORIGINAL COST — The new, compact Ellernan Calciner costs LESS THAN HALF the price of ordinary calcining installations.

Ellernan Calciners treat small-size LIMESTONE, DOLOMITE, PHOSPHATE, GYPSUM, CLAY, etc. The unit preheats, calcines and cools automatically and continuously with exact temperature control. Completely flexible . . . Ellernan Calciner installations are adaptable to any size plant, to handle any capacity.

Write or wire for full details to

THE ELLERNAN COMPANY

1210 Continental Bank Bldg
Salt Lake City, Utah

Serving the Industry Throughout the World

If you use filter systems...

CHECK THESE MULTIPLE ADVANTAGES OF THE REVOLUTIONARY Dualaire* New DUST COLLECTOR!

No pressure surges!
No filter choking!
Efficiencies up to 99.99%!

Why The DUALAIRE Is Better!

Here's the heart of the DUALAIRE principle. Gas enters through top of filter tube (A). Dust is filtered out along length of filter surface and as it begins to build up (B), the slight change in differential pressure causes the reverse-jet blow ring to go into operation. This ring fits tightly around the filter tube and concentrates a jet of air (C) that blows from the outside inwardly through the filter fabric (D).

As the ring moves up and down the tube, the fabric is flexed and blown at the same time, thus loosening the dust in small portions. The blow ring travels up and down the filter tube until the filter is clean, then automatically stops until the tube again requires cleaning.

Cleaning action is uniform and steady. There are no sudden pressure surges as filter surface is cleaned — no destructive rapping or jarring operations to shorten life of filter element — no wide variations in gas flow or plant efficiency!

If you use bag-houses or other similar collecting systems in your plant operations, be sure to investigate the *many* vital advantages built into Western Precipitation's new DUALAIRE Dust Collectors. Backed by the same well-known organization that pioneered commercial application of COTTRELL Electrical Precipitators and MULTICLONE Mechanical Collectors, DUALAIRES bring entirely new performance and efficiency standards to filter-type collection systems.

As outlined at the left, heart of the DUALAIRE is a reverse-jet blow ring that travels up and down the cloth filter tube, keeping it clean without the alternate choking and pressure surges characteristic of conventional rapping, vibrating, or jarring systems of cleaning off the collected dust. *Result*—

▶ **UNIFORMLY LOW PRESSURE DROP** is assured, because the collected dust is removed steadily and in small increments — not by sudden surges!

▶ **UNIFORMLY HIGH EFFICIENCIES** — as high as 99.99% under actual field conditions — are maintained by the constantly-cleaned filter surfaces. There is no "choking" action — no variation in filter efficiency as dust accumulates!

▶ **LONGER FILTER LIFE** is obtained because the filter fabric is not subjected to destructive jarring, rapping and vibration of conventional filter cleaning methods. The Dualaire cleaning action is gentle — yet far more effective!

▶ **LESS EQUIPMENT IS REQUIRED** to handle a given capacity with the Dualaire because no standby sections need be provided for gas cleaning while other sections are shut off for rapping. The Dualaire filter is kept constantly clean — automatically — while it is filtering out the suspensions. The gas is filtered and the dust removed simultaneously — without interruption. Saves space, simplifies installation!

▶ **MAXIMUM ADAPTABILITY** to varying installation requirements is assured by the "sectionalized" design of the Dualaire. Each section is available in 5 different heights — and as many sections can be bolted together as desired to meet plant requirements. As needs increase, simply add more sections!

▶ **EFFICIENT STRAIGHT-THRU DESIGN** of filter tubes assures easier dust recovery, better flow. Dirty gas enters top of tube, is filtered through the walls, and dust drops by gravity through bottom of tube into collection chamber. Separated material does not re-entrain in the gas flow.

There are many other advantages built into the DUALAIRE. *For further details send for this descriptive 12 page booklet. Or contact your nearest Western Precipitation representative!*

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*"Dualaire" & "Multiclone"

Licensed by H. J. Harvey, Jr.

CONCRETE PRODUCTS

CONCRETE UNITS · READY-MIXED CONCRETE

Part of the fleet of 26 mixer trucks operated by Radcliff Gravel Co., Inc., Mobile, Ala.

CONCRETE PRODUCTS made with Atlas Duraplastic cement being stored at Kubach Concrete & Cinder Block Plant, Islip, New York. A unique feature of this plant is the solar-heated curing house shown at lower right.

Duraplastic* reduces breakage...improves product appearance

"We've reduced costly breakage and increased our production by making our block with Atlas Duraplastic cement," reports William Kubach, owner of Kubach Concrete & Cinder Block Plant, Islip, N. Y. "Duraplastic cement gives us better-looking block with greater resistance to the passage of water."

Other manufacturers have also found that their concrete products are easier to produce and sell when they are made with Atlas Duraplastic air-entraining portland cement. That's because smooth, cohesive Duraplastic-made mixes feed easily through the machine . . . give products sales-promoting good appearance — clean, true edges and rich face texture.

• • •

You'll find that Atlas Duraplastic cement will help reduce production costs and increase sales of all types of concrete products. Yet it costs no more than regular cement . . . requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. Write now for free descriptive booklet to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, New York.

FEWER REJECTS and less breakage in the handling of green products mean lower production costs . . . higher profits for concrete-products manufacturers who use Atlas Duraplastic cement.

OFFICES: *Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.*

"Duraplastic" is the registered trade-mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company

ATLAS®

DURAPLASTIC

AIR-ENTRAINING PORTLAND CEMENT

CP-O-176

Makes Superior Concrete Products at No Extra Cost

UNITED STATES STEEL HOUR — Televised alternate weeks — See your newspaper for time and station

INDUSTRY NEWS

Cover Picture

ON THIS MONTH'S CONCRETE PRODUCTS COVER may be seen part of the fleet of 26 mixer trucks operated by Radcliff Gravel Co., Inc., Mobile, Ala. This company also operates a plant producing lightweight concrete masonry units, a bituminous mix plant for both hot and cold mixes, and also distributing yards in Pensacola, Fla., for concrete block and aggregates. It also is said to be the largest processor of oyster shells between Jacksonville, Fla., and Houston, Texas.

Concrete Short Course

A PRESTRESSED CONCRETE SHORT COURSE will be held October 10, 11, and 12, 1955, at the Maritime Base, St. Petersburg, Fla. The course is being co-sponsored by the Prestressed Concrete Institute and the University of Florida Civil Engineering Department. The first two days of the short course will be devoted to lectures giving a review of beam theory, basic theory of prestressing, prestressing methods, materials used in prestressed concrete, post-tensioning and pre-tensioning, design of simply supported beams, design of beams having variable cross sections, etc. Design seasions will also be conducted, enabling the attendants to design both simple and complicated structures.

The third day will be devoted to papers, movies and slides presented by engineers in the prestressed concrete field. Various topics will be discussed including materials, design, manufacture, present use and future possibilities of prestressed concrete structures. An optional field trip to a casting yard in the area is also being planned.

Precast Wall Panels

THE MARIETTA CONCRETE CORP., Marietta, Ohio, has supplied approximately 140,000 sq. ft. of large precast concrete insulated wall panels for the new plant of Union Carbide & Carbon Corp.'s Electric Metallurgical Div. at Ashtabula, Ohio. The panels were produced at a new $150,000 plant at Marietta, Ohio, especially built for that purpose. The panels were trucked to the building site, 225 miles distant, on large trailer trucks. The job required approximately 300 truck-trailer loads. The panels were used in the construction of four buildings: a 70-ft. high furnace building, a machine shop, and service and locker buildings. Erection of the panels was handled by North American Precasters, an associate of the Marietta firm. Construction was under the supervision of

Concrete wall panels are attached to walls by a crew of 9 men using a mobile crane, at a rate of about 4000 sq. ft. per day. Special broomed exterior finish gives panels the appearance of cut limestone

Ford, Bacon & Davis, Inc., the engineering department of Electro Metallurgical Co., and J. Fruchtbaum, engineer, Buffalo, N. Y.

Similar precast wall panels were used in the construction of Electromet's large new ferro-alloys plant near Marietta. Engineers estimated use of the panels on that project cut wall construction costs 30 percent, or about $600,000. A 9-man crew, using a mobile crane, can install four 8- x 10-ft. panels in an hour. The panels are tongue-and-groove in design. Horizontal seams are sealed with concrete. Metal inserts cast into the panels permit them to be bolted to the metal framework of the building.

Kansas Ready Mix Plant

CONCRETE MATERIALS CO., Kansas City, Kan., is building a modern ready-mixed concrete plant in Bonner Springs, Kan., on Union Pacific property adjacent to the Lone Star Cement Co. plant. It will have a capacity of 100 cu. yd. per hour. Guy Stanley is president of the company, which also operates a ready mix plant in Kansas City. The firm has a fleet of 35 transit mixers.

Dayton Builders Adds Two-Way Radio

DAYTON BUILDERS CONCRETE CO. recently became the first commercial firm in Dayton, Ohio, to install two-way radio to expedite ready-mixed concrete deliveries, according to George J. Frye, secretary and general manager. The radio sets, leased from Ohio Bell Telephone Co., are installed in 17 ready mix trucks.

OXBORO CEMENT PRODUCTS CO., Bloomington, Minn., has been purchased by Ira A. Desper, who is operating the plant as the Desper Cement Products Co. The plant is being expanded and will manufacture concrete septic tanks, cesspools, concrete pipe and concrete specialties.

THE PARKERSBURG CONCRETE PRODUCTS CO., South Parkersburg, W. Va., has been purchased by E. Carl Langfitt from Bernard P. McDonough. The plant has a rated capacity of 6400 concrete block daily.

DES MOINES CONCRETE PRODUCTS CO., West Des Moines, Iowa, has started production of three types of dry pre-mixed concrete; sand, masonry and gravel mixes, sold under the Demco trade name. The company also manufactures concrete block.

NORTH HOLLYWOOD CONCRETE TILE CO., North Hollywood, Calif., has expanded its plant, doubling production with the installation of a Besser "Super Vibrapac" and a 12-in. high Columbia block machine, making a total of four block machines at the plant.

NATIONAL CONCRETE MASONRY ASSOCIATION has prepared a four-page folder on "Concrete Masonry Control Joints, Lintels, and Retaining Walls," which gives recommendations on design and use. Reprints are available to members.

WAXA-MIX CONCRETE CO. has opened a new ready-mixed concrete plant 1 mile west of Waxahachie, Tex., on the Fort Worth Highway. Royal Eubank and Luther Eubank are the owners.

READY-MIX CONCRETE AND LUMBER CO., Algona, Iowa, began operating a new ready-mixed concrete plant in April. Storage facilities include an 800-bbl. cement silo and a three-compartment aggregate bin. H. J. Cowan is owner.

NORTHERN CONCRETE PRODUCTS, INC., Petoskey, Mich., has been sold by Norman and Marvin Feather to Alpena Cement Products Co., Alpena, Mich. Alfred Sober of Alpena is the new plant manager.

GOODLOW AND COLE READY-MIX CONCRETE CO., Colorado Springs, Colo., has been purchased by Al Goss of Boulder, Colo., and is now operating as the G & C Ready-Mix Concrete Co.

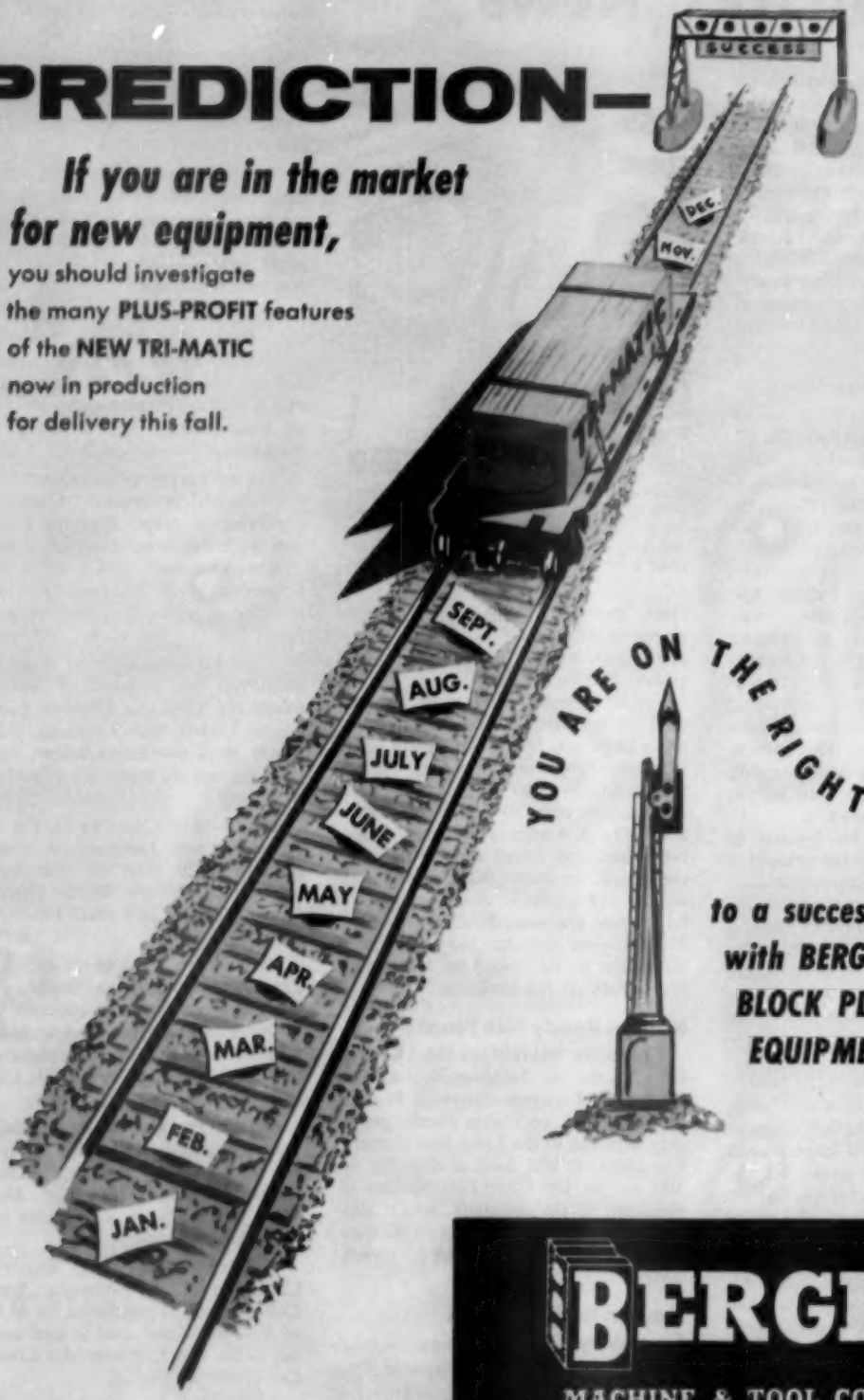
BLUE DIAMOND CONCRETE CORP. began operating a new ready-mixed concrete plant in Des Moines, Iowa. Lyle Rhodes is superintendent.

CULPEPER STONE CO., INC., Culpeper, Va., has been incorporated with $50,000. Werter H. Hurt is president.

PREDICTION—

If you are in the market for new equipment,

you should investigate
the many **PLUS-PROFIT** features
of the **NEW TRI-MATIC**
now in production
for delivery this fall.



YOU ARE ON THE RIGHT TRACK . .

to a successful future with BERGEN BLOCK PLANT EQUIPMENT

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MACHINE & TOOL CO., INC.
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TRANSIT
WESTINGHOUSE
MIXER

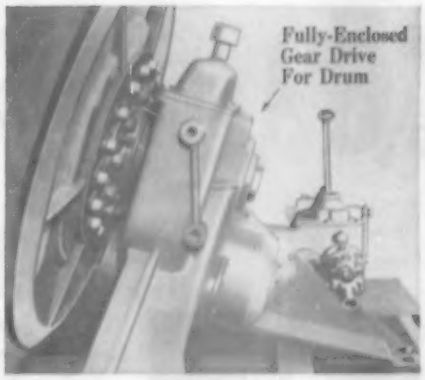
The Only Transit Mixer With Enclosed Gear Drive

● All other things being equal, or better, don't you think that a mixer with drum driven by enclosed gears would be preferable to one driven by exposed gears or chains? That's what you get in Westinghouse Transit Mixers—the only mixers with enclosed gear drive.

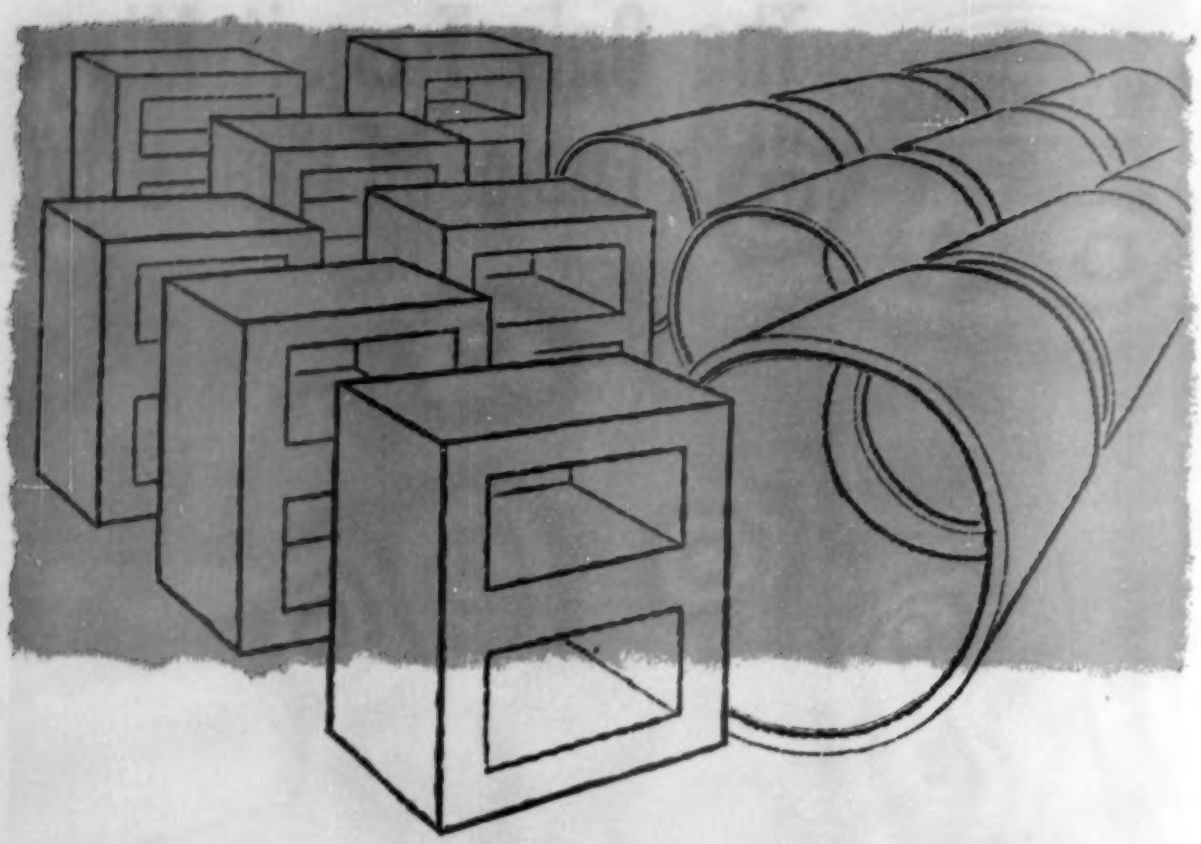
With this valuable patented feature you get a ball-and-socket self-aligning drum mounting, "double-action" mixing drum which accomplishes a quicker, more uniform mix, 2-speed transmission and other features which you'll like.

Westinghouse Mixers are thoroughly dependable and economical—time-tested by prominent users. They're available in 5 sizes—4½ to 6½ yd. Write now for descriptive literature to

ADAMS DIVISION
LeTourneau-Westinghouse Co., Indianapolis, Indiana
Member of NRMCA



The Westinghouse enclosed-gear drum drive requires no more attention than a standard automobile transmission. No chains to break—get too tight or too loose. No pinion and rack to wear out from abrasion. No daily lubrication . . . No stresses are transmitted to any part of drive due to frame flexing in traveling over uneven surfaces.



Increase output and quality

of concrete products with low-cost D-40

Let us show you how D-40 has helped other concrete products manufacturers make superior products, with a reduction in rejects, and at the same time increase production.

Economical D-40 plasticizes the "mix" to flow easier and more quickly into molds—filling out the corners and resulting in more perfect products. An added advantage is the reduction of abrasive wear on mixing and molding equipment.

Dry, granular detergent D-40 is easily added to the "mix" at the ratio of one to two oz. per bag of cement. Our experience is at your disposal. Contact any Oronite office for free sample of D-40 or ask for an Oronite detergent specialist to contact you.

ORONITE CHEMICAL COMPANY

3404

ORONITE CHEMICAL COMPANY

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30 Rockefeller Plaza, New York 20, N. Y. • 20 North Wacker Drive, Chicago 6, Ill.
Mercantile Securities Building, Dallas 1, Texas • Carew Tower, Cincinnati 2, Ohio

Two Mack B42's . . . part of the sixteen-unit fleet of the Allen's Ready Mix Concrete Company, Memphis, Tenn.

Macks cut maintenance costs 90%

Take it from Mr. S. G. Allen of the Allen's Ready Mix Concrete Co., Memphis, Tenn., when he says Macks really save him money.

Before he put Macks on his jobs, his monthly maintenance costs averaged more than $1,000. Since switching to an all-Mack operation of sixteen mixers and dumpers, he finds these average monthly costs for his entire fleet have been cut to less than $100!

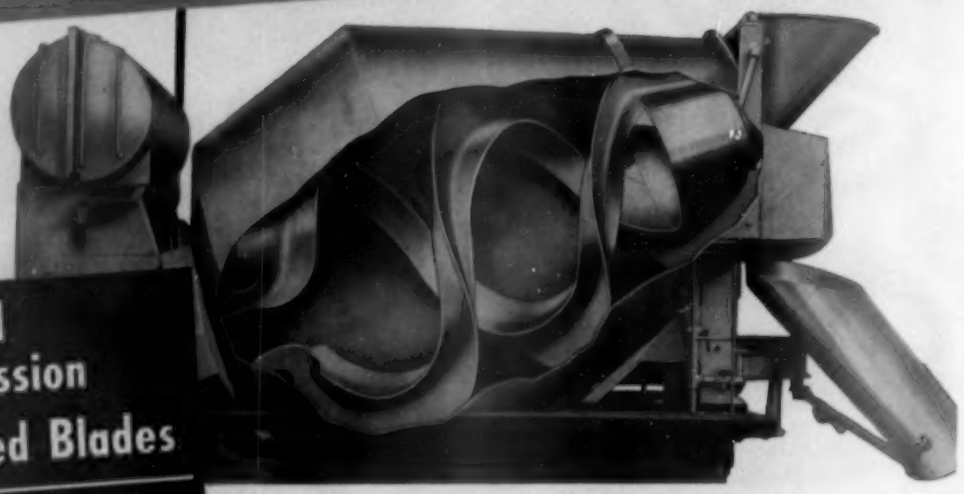
As Mr. Allen puts it, "Macks have made an important contribution to the success of my business. In my opinion, Macks are the finest equipment ever built. They have no equals for long life, dependable service, minimum down time and low-cost operation."

High praise for Mack performance? You bet! But ask other owners and operators of Macks throughout the country and see how they agree with Mr. Allen. It's no wonder that in the construction industry the "word" is—it pays to standardize on Macks.

MACK TRUCKS Empire State Building, New York 1, N. Y.

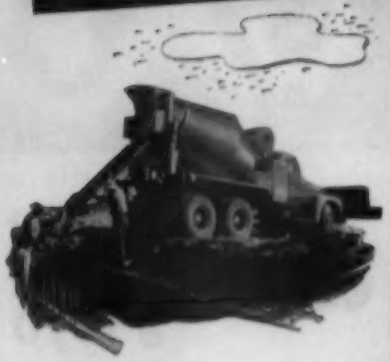
3357

SMITH
DE LUXE TRUCK MIXERS



Cutaway view of the Smith De Luxe Truck Mixer drum. Note the patented "T"-shaped blades — the greatest improvement in mixing action ever put into a truck mixer drum.

2-Speed Transmission
+ T-Shaped Blades
= Better Mixed Concrete



Want Quality Concrete... in a Hurry?

If you do, the Smith "concrete factory" with the PATENTED "T" SHAPED BLADES and 2-speed transmission, is your answer. In any inclined axis drum the heavy rock naturally rolls to the lowest point, and the fines will float. Smith has the *only* blade which counteracts this segregation. The mix is pulled to the big end of the drum, picked up, turned over, and poured into the center of the batch. True flow action takes place.

The 2-speed transmissions, standard on Smith mixers, give you the complete range of drum speeds needed regardless of the length of haul. You never need to undermix or overmix in a Smith . . . you have complete control.

The proof is in the concrete which you discharge from your Smith . . . the last shovelful out of the drum is exactly the same as the first shovelful. Call or write your nearby Smith dealer for complete details.

The T. L. SMITH CO., 2885 N. 32nd St., Milwaukee 10, Wis. U. S. A.
Affiliated with Essick Manufacturing Co., Los Angeles, California

SMITH
T. L. SMITH CO. MILWAUKEE

Builders of Better Mixers for More Than 50 Years

A 8316-1P

BESSER helps block plants *Sell More Block!*

National Advertising in Architectural and Building Publications Creates Interest in Concrete Masonry... Stimulates the Demand For All Types of Block

Every block maker knows how the Besser Company pioneered perfection in concrete block . . . always striving to help the industry produce better block on a faster, high-production basis. But the Besser Company doesn't only design and build block making equipment. Besser also promotes the sale of block.

In all principal architectural and building papers, Besser advertising is telling the entire industry all the facts about this modern masonry material. Millions of Besser ads are pre-selling the products of VIBRAPAC Block plants throughout the world, thereby boosting the demand for block and increasing sales.

No doubt about it . . . the mounting trend toward VIBRAPAC Block and BES-STONE Split Block for exteriors and interiors is solidly founded on Besser's continuous promotion, plus highest standards of beauty, permanence and other qualities of VIBRAPAC Block.

Besser Helps You Produce High-Quality Block—Faster!

A Besser Vibrapac produces three 8" x 8" x 16" modular block at a time on ONE Plain Pallet. Other units, made in equivalent multiples, on the same set of Plain Pallets. Fully automatic. One man removes finished block with power off-bearing hoist, and, with no lost motion, returns empty pallets to the Vibrapac machine.

Ask your nearby Besser representative to help you produce and sell more quality block. No obligation. Write today.

BESSER Company

BOX 135 • ALPENA, MICHIGAN, U.S.A.

Complete Equipment for Concrete Block Plants

A 8184-1PBC

PROMOTERS OF HIGH QUALITY CONCRETE MASONRY FOR MORE THAN A HALF CENTURY

EXTRA PROFITS from EVERY TRUCK, with 2-WAY RADIO

Complete Control—Your dispatcher has constant contact with every operation every minute of the day . . . he knows where every truck is and the progress of every job . . . with Motorola 2-way radio, you can plan a more efficient work day, getting more production out of every mixer.

Rerouting—When a truck arrives at a form that's not ready, a quick Motorola call right from the truck, and the concrete is directed to a site nearby, saving valuable time and money.

Fast Repair—Prompt assistance is 2-way radio dispatched to a damaged truck in *seconds*, wherever it breaks down—virtual assurance against dumped loads.

Minimum Overtime—Motorola 2-way radio gets the job done faster and slashes costly overtime to a bare minimum.

Batch Plant Contact—Drivers can radio direct, telling how many more yards of mix will be needed. Guesswork is eliminated, and plant men get out on time.

Satisfied Customers—In this business, service is one of the biggest things you have to sell. With Motorola 2-way radio, you can keep your promises and deliver *when wanted*, even when emergencies crop up.

Radio's flexible operation makes this possible.

A Motorola engineer will show you how Motorola 2-way radio will earn extra profits from the *first day* of operation! Motorola will furnish the equipment you need on the terms you want—cash purchase, installment plan, lease (with or without equity) . . . with optional installation and maintenance all included in a single contract. Write, phone, or wire TODAY!

MOTOROLA

2-WAY RADIO

MOTOROLA COMMUNICATIONS & ELECTRONICS, INC.
A SUBSIDIARY OF MOTOROLA, INC.
4501 AUGUSTA BOULEVARD • CHICAGO 51, ILLINOIS
ROGERS MAJESTIC ELECTRONICS LTD., TORONTO, CANADA

Motorola consistently supplies more mobile and portable radio than all others combined.
Proof of acceptance, experience and quality.
The only COMPLETE radio communications service—specialized engineering . . . product . . . customer service . . . parts . . . installation . . . maintenance . . . finance . . . lease.
"The best costs you less—specify Motorola."

More ready mixed concrete is sold in
JAEGER truck mixers than by any other method

SMALL PLANT SOON NETS 10%: In this grass-roots town of 12,000 population (name on request), they started just 2 years ago with 3 used Jaeger truck mixers and a 60-ton, two compartment bin with 3 yd. weigh batcher and bucket elevator. One mixer was a 3 yd. on GMC single axle truck, the others were old 2 yd. units on K-6 Internationals. With this equipment they were able to reach a top production of 247 yds. in one day, on a 2700 yd. sewage disposal plant.

Their first truck mixer bought new was a Jaeger 4½ yd. "Mix Plus" model on T800 Ford. Bought for a 2300 yd. curb and gutter job, this new mixer poured a steady 10 yds. an hour, including 3-mile trip. Their next purchase will be a matching 4½ yd. giving them a fleet of two 4½ yds., one 3 yd. and a 2 yd. standby — all Jaegers and all profitable. Their total investment, to date, is approximately $60,000 including inventory. Started in June, 1953, this business quickly began to show a profit. For the year 1954, their net return on investment, after depreciation and all charges, was a tidy 10%.

More ready mixed concrete is sold in Jaeger truck mixers than by any other method. Ask your Jaeger distributor to show you why, or write us for complete information.

THE JAEGER
MACHINE COMPANY

603 Dublin Avenue, Columbus 16, Ohio

LOADERS • COMPRESSORS • PUMPS
CONCRETE MIXERS • PAVING MACHINES

KOEHRING 6-yard DUMPTOR®

puts stockpiling on a fast, shuttle-haul basis. There's no need to turn at the loader, or on top of the pile, because constant-mesh transmission gives full-speed travel in either direction. This no-turn advantage saves at least 2 slow turns on every trip . . . cuts 30 seconds off normal cycle time.

To dump, operator drives up to edge of stockpile, trips the body-release lever . . . and the gravity-dump body instantly tilts 70°. Fast dumping action kicks the load out over edge of bank, saves a lot of dozer clean-up on the pile. There's no 15 to 25-second wait for slow-acting body hoists. What's more, gravity-dump never balks, never wears out.

Let your Koehring distributor show you what these practical Dumptor advantages can mean in increased production and lower costs on your stockpiling and other off-road hauling jobs.

CK438

KOEHRING COMPANY, Milwaukee 16, Wisconsin (SUBSIDIARIES . . .

Stockpiling operation (above) shows typical no-turn shuttle advantage. Dumptor drives up to the edge of stockpile, body forward . . . dumps, and heads back for the next load, without turning.

From top of stockpile, Dumptor returns to loader via access ramp . . . or, as shown at left, can continue on down side of stockpile after dumping load. (Climbs 24% grades fully loaded.)

Big, square body opening permits loading over ends or sides by shovel, dragline, or conveyor. Dumptor pulls up, loads, drives away . . . without making a turn.

JOHNSON • PARSONS • KWIK-MIX

CENTRAL CEMENT FEED

prevents gumming

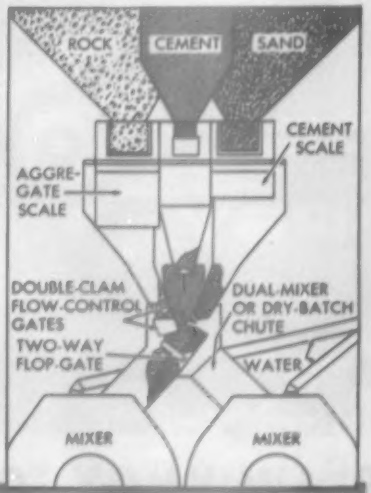
reduces dusting

pre-shrinks materials

Johnson Concentric Batcher provides these practical advantages for fast, economical weigh-batching of aggregates and cement:

- Concentric arrangement of aggregates around the cement batcher discharge gives central cement feed. This prevents "gumming", reduces dusting, pre-shrinks materials. All ingredients are intermingled as they flow through discharge.
- Cement, concrete's most expensive ingredient, is weighed individually on a precision-beam scale, in a separate batcher hung within the aggregate hopper.
- Adjustable rate of discharge on cement permits extremely accurate ribbon-feeding. Semi-automatic cement arrangement cuts off just ahead of final weight.
- Aggregates are weighed on accumulative dial scale, or on individual weigh-beam scales.
- Two-way discharge with dual chutes are available for charging 2 stationary mixers, or for charging into 1 stationary mixer and a truck-mixer, or dry-batch truck.
- Concentric Batcher sizes range from 2 to 8 cu. yds., and can be arranged for 2 to 8 aggregates — plus 1 to 4 types of cement. Choice of controls: fully automatic air-ram operated, semi-automatic, or manual, to best suit your needs.

Let your Johnson distributor show you all the other production advantages you will get with one of these patented Concentric Batchers in your plant. See him, or write to us.



(Receiving Subsidiary) C. S. JOHNSON CO., CHAMPAIGN, ILL.

CONCRETE PLANTS • BINS • RECEIVING HOPPERS • ELEVATORS • SILOS • BUCKETS

Haul extra yards each trip
Save time with more maneuverable short wheelbase trucks

USE BLAW-KNOX *Hi-Boy* TRUKMIXERS

How would you like to haul a load or two more a day... and carry maximum legal pay load each trip?

You can do it easily with Hi-Boy Trukmixers!

Hi-Boy 4½, 5½ and 6½ cu. yd. Trukmixers are designed to solve three profit-stealing problems... weight, length and axle load. Combining the flush water tank and pedestal, reduces total weight of the unit by about half-a-ton and substantially lowers the center of gravity of the mixer. Locating the engine to the left rear permits moving the mixer forward 20" and shifts the load center of gravity closer to the front axle so it can carry more of the legal weight allowance. These design improvements let you use highly maneuverable short wheel base trucks that get you through traffic, into the job site, up to the forms and back to the plant *fast*. In the time saved you can often haul an extra load or two a day!

MORE *Hi-Boy* DESIGN IMPROVEMENTS

Large Diameter Short Drum mixes even zero slump concrete fast and thoroughly. Concentrates batch at front end for better over-all weight distribution.

Big Inner Cone for Fast Charging . . . 8-9 seconds per yard . . . and eliminates spilling of materials.

Better Blade Design, with flange on the discharge side, prevents segregation during discharge.

Low Maintenance results from the accessibility of the side-mounted transmission and engine, which permits easy inspection of vital parts. Engine and radiator enclosed against all weather conditions. Inexpensive, easily cleaned air filter protects the radiator.

Be sure to investigate the many more profitable, practical Hi-Boy features before you decide on any truck mixer . . . and ask your Blaw-Knox distributor to explain the advantages of the Blaw-Knox "Complete Ready-Mix Package."

BLAW-KNOX COMPANY
CONSTRUCTION EQUIPMENT DIVISION

Pittsburgh 38, Pa.
Offices in Principal Cities

Office of the company is an attractive concrete structure

Close-up of neon sign located on office grounds which is mounted on concrete column of unusual design

More Plants — Big Mixer Units Meet Increasing Demands for Concrete

• Walt Keeler Co., Wichita, Kan., operates five ready-mixed concrete plants and produces its own sand, gravel and stone materials; also sells related building products

By TIP BROWN

OPERATIONS IN THE READY-MIXED CONCRETE and building material field by the Walt Keeler Co., Wichita, Kan., have attracted widespread interest. Rapid growth of the business and the unconcealed ambitions of the management to challenge the times in keeping abreast of them have focused attention on this company. As an example, there was the switch to 3½-cu. yd. mixers back in 1941, then to 5½ cu. yd. in 1947, and just now a major shift to 7½ cu. yd. and to double-tandem chassis equipment. Not only have these changes involved radical local adjustments, they have kept manufacturers on the alert and have offered a national challenge to a complete reappraisal of weight distribution and load limitations on highways.

To get a real picture of this expansion, a visit to the original location of plant No. 1, known as the Central plant, is a must. It is still the heart of the entire operation and was established in 1943, less than a mile from downtown Wichita. The property is 1000 ft. long and 200 ft. wide. An attractive detached one story office building was completed in 1949. Designed by the company, using its own materials, the plant's maintenance has been practically nil. It has unexcelled facilities for efficient operation as office and dispatching headquarters, with ample parking facilities, pleasing landscaping, and a sidewalk sign of original design mounted on an ornamental concrete post which leaves an indelible impression upon the public. The building is headquarters for Walter M. Keeler, president; Wallace Sparks, general manager; Earl Henderson, sales manager; Ralph Oliverson, assistant manager; and a staff of office manager, credit manager, dispatcher, bookkeeper and secretary. The complete payroll includes 90 people.

Central Mixing Plant

A central concrete mixing plant, served by two tracks of the Santa Fe railroad, receives sand, stone and cement shipments by switching operations at noon and at night. Stone and sand is stored in a four-compartment, 300-ton capacity bin which may be filled direct from open top rail equipment by a 2-cu. yd. Model 604 Koehring clamshell or alternately from open stockpiles by Hi-Loader deliveries to the base of a belt conveyor at ground level which extends to the overhead storage bins. Movement of sand from the ground to the 95-ft. high storage bin was recently checked at 10 tons in

One of the latest 7½-cu. yd. mixer trucks, to the right, pulling away from one of the ready-mixed concrete plants

3½ min. This same Hi-Loader is often used as a pusher to move railroad cars to other spur track locations. The cement bin, holding 800 bbl. is served by a bucket elevator and screw conveyor system which receives cement from hopper bottom cars. A unique device for aiding gravity in the unloading of cement is an 18-ft. length of pipe carrying compressed air to aerate the cement. It is operated by a man standing on top of the freight car.

Plant Layout

Adjoining the concrete plant to the north is a 25- x 300-ft. reinforced concrete warehouse, in which is stored a wide variety of building materials; such as, fire brick, lime, roofing aggregates, special types of packaged cements, plaster, expansion joints in sheets, floor hardeners, as well as miscellaneous used equipment which is being held in reserve. Six door openings are on the track side for unloading from rail cars, and six on the east side for reloading on trucks. Building materials are stocked as a necessary corollary of the ready-mixed concrete business and a service element that is important to purchasers.

A continuation of this same type of construction, covering the east boundary of the plant site, houses one of the most important centers of the entire operation. Repairs to equipment in this building keep from six to ten highly skilled mechanics busy the year round. They take care of the upkeep of the transit mixer fleet, the mechanical needs of the Central, South, West, and North mixing plants, a sand producing plant, a new quarry under development at Florence, Kan., 50 miles northeast of Wichita, and another new mixing plant soon to be completed in the eastern section of Wichita.

Shop Facilities

Dried sand, shipped by rail in carload lots from Topeka, Kan., and used for sand blasting as a preliminary to painting, is kept in a special bin. This department can be completely closed off from the rest of the shop area.

Well filled tire racks emphasize the importance of necessary reserves. Tire sizes have been standardized on a 10 x 22 basis, and are therefore interchangeable on motorized equipment. All mixers and trucks are operated on butane fuel, and twice a day replenishments are made by a special butane service truck.

Another arresting sight is the "Parts Room" which can easily pass for a good sized accessory store. The stock of fittings, fan belts, gears, bearings, and other hundreds of spare parts is maintained by regular visits of salesmen who supply replenishments for low inventories. This department also has a hydraulic press, valve grinding machine, brake machine and lathe for armature service.

The motor overhaul department provides a Coffing overhead roller hoist for a section of the shop handling heavy parts. An area that can be enclosed is reserved for welding. Steam cleaning for motors is also provided. Another space is set aside for regular servicing of trucks on a ten-day average inspection basis. In 1946, book records were started on servicing of individual trucks. This has been of very great value in proving that closely supervised upkeep is a distinct asset in cutting down equipment mortality. Space is also available here for lockers for mechanics.

A covered section of the building, open to the outside, is set aside for truck storage with convenient water connections and overnight oiling and greasing service. Guard service is also maintained for the protection of this property.

The south end section of the shop building, reserved for the office of general superintendent, Joe Vaught, is equipped with a telephone and intercommunicating system. Space is set apart here for a lounging room for drivers and other employes which includes a heavily patronized coffee urn. This employe service has become a rather imposing item of expense due to its popularity, but it has offset a difficulty experienced in the past with drivers who were inclined to congregate for coffee at places along delivery routes thereby slowing up the service to the job. Future planning provides for a second story addition to this part of the building to permit installation of shower baths and other change house facilities.

A triangular concrete paved area, occupying the space between the warehouse and shop structures, serves for easy access to warehouse door openings. At the south end, an ample area of perhaps a hundred feet square, is thus provided for easy movement of trucks moving to and from the concrete plant loading spout. Lack of congestion at this point is credited with a high degree of efficiency in mixer truck movement.

Other outside space is utilized for a 20- x 75-ft. wash rack pit, 4 ft. deep. Twenty to 30 trucks are washed daily. Space is also available outside for storage of sewer pipe and reinforcing steel. A sizeable investment has been made in standby truck equipment which is sent out on relief trips when transit mixers get mired in the mud or become involved in traffic difficulties. Much of this difficulty has been overcome since all trucks are

Walt Keeler, president of the company

J. Wallace Sparks, general manager

Sand and gravel processing plant which supplies aggregates for ready-mixed concrete plants operated by company

A 75-ft. dredge, working at a 65-ft. depth, produces 1000 tons of sand per day

now equipped with front wheel drive which gives maximum traction and avoids much lost time on off-the-road operations.

Operates Sand Plant

The Walt Keeler Co. supplies all of its ready mix operations from its own aggregates plant on Highway 42 in the southwestern area near Wichita. Operating in a 90-acre tract, a 75-ft. Eagle Swintek dredge is working at at 65-ft. depth, producing 1000 tons of sand each day, which is moved to the company's concrete plants by both rail and truck. Two overhead, steel bins store 100 tons. The plant is operating in a 3-ft. water table area. A source of pride with the management is the effort to maintain good housekeeping practices in a location that is not constantly exposed to public view. The effect is immediately noticeable to the visitor, and the practice is undoubtedly a good morale builder for the employes.

South Concrete Plant

The one year old South plant in the county, six miles southeast of downtown Wichita and opposite the Boeing Airplane Plant and the McConnell Air Force Base, is the ultimate expression of company engineering and construction talents. The 100-ft. high, reinforced concrete mixing plant dominates the landscape like a light house set on the prairie which can be seen for miles around. It is as nearly automatic as can be devised. Two switch tracks of the Santa Fe railroad extend the full half-mile length of the property with room for 15 to 20 cars at unloading spots for cement, sand, and stone. The site offers plenty of room for future expansion.

Trucks deliver company sand to an inclined ramp at the west end of the site and dump at an 8-ft. center height through a pipe grating grizzly into a pit. Sand is carried by belt conveyor to a maximum height of 30 ft. and released to a 10,000-ton open storage stockpile.

Stone is stored in open reinforced concrete bins of 1000-ton capacity. The four compartments permit storage of stone sizes to meet consumer needs. Gates below bins release stone to tunnel belt conveyor which takes the material to the boot of a bucket elevator for storage in the concrete plant overhead bins.

The storage bins in the concrete plant can accommodate 12 carloads of cement or approximately 4800 bbl. The bins are designed to create flexibility in drawing stored cement through special spout arrangements. Similar spout controls are used to draw stone from storage to meet varying specification requirements for stone sizes.

Overhead bins include two 150-ton and four of 75-ton capacity for the mixing plant's sand and stone supplies. The bottom of these bins tapers to a 45-deg. angle to permit ready flow of materials. This seemingly wasted space beneath the slope has been put to good use as an overhead water storage of 30,000 gal. capacity. The entire concrete enclosure forming the storage was thoroughly sealed against water penetration. The water supply from a 110-ft. company owned well on the grounds is delivered by a 3-in. Deming pump.

Only three men operate the concrete plant. One man handles cement, one man operates the batching mixer, and one man controls material conveyors. A 7-cu. yd. batcher has Howe scales with air-controlled valves. Blended materials are handled through a 7-cu. yd. T. L. Smith Tilter mixer for premixing prior to release to transit mixers waiting at the ground level spout. Drainage facilities have been given careful attention to prevent water accumulation at the truck charging station. An intercommunicating system is wired to all needed points in the plant, and a noise-proof room has been built for outside telephoning. A square, open steel enclosure houses a two-man capacity automatic elevator, operating from the ground level to the top of the building. The plant handles 100 cu. yd. of concrete per hour.

West Plant

The No. 4 plant, designated as the West plant, was completed early in June. It will serve a growing industrial and residential area developing around the recently completed Wichita Municipal Airport which is considered one of the finest anywhere in the world.

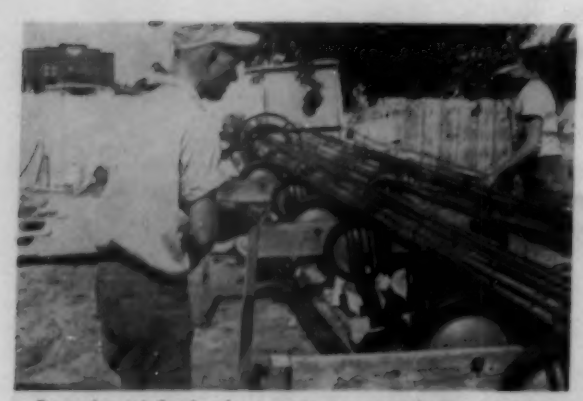
North Plant

The No. 3 plant is in the north section of town, bordering on an industrial section that includes milling and refinery plants as well as livestock yards and packing houses. The plant is in the final stages of completion. Stone and sand will be moved by crane, up to 1000 cu. yd. daily. The North plant is also designed for 100 cu. yd. of concrete per hr. The Rock Island railroad serves the new plant with two switch tracks. Company equipment was moved to the site from a recently completed mixing and delivery job on one of the world's largest grain elevators at Enid, Okla., which used 240,000 cu. yd. of concrete. The prime contractors were Chalmers & Borton of Hutchinson, Kan.

East Plant

Ground along the Frisco railroad has just been purchased for a fifth mixing plant at a location in the eastern part of Wichita, eight miles distant from the business center. The area will be a development of residential and shopping centers to take care of popu-

(Continued on page 162)



Preparing reinforcing for precast, prestressed concrete poles

Applying tension to reinforcing steel in molds for concrete poles

Prestressed Concrete Poles

• Florida Power Corporation is making extensive use of a prestressed concrete pole of new design

By C. E. WRIGHT

AFTER TWO YEARS OF RESEARCH and months of actual use, prestressed power line poles installed by the Florida Power Corp. have proved so satisfactory that their use will be extended, according to H. K. McKean, vice-president in charge of operations of that company.

"The results of the Florida Power Corporation's experiments with a 35-ft. concrete pole design," said Mr. McKean, "are so satisfactory that design and development of a 45-ft. concrete pole of the same basic design has now progressed to the point where the forms are being constructed. It is believed that a 45-ft. pole is probably the maximum length that can be fabricated satisfactorily and economically by casting methods. However, the possibilities of concrete pole transmission line construction appear so attractive that designs have been prepared for prestressed poles of 65-ft. and 70-ft. lengths." Mr. McKean adds that an experimental section of a 100 kv. transmission line will be built some time this year, not only with concrete poles but with concrete crossarms.

The increasing scarcity and cost of wood poles, together with their decreasing life span, led the Florida Power Corporation to undertake a study of a substitute material. After considerable research and preliminary cost studies it was determined that concrete was a reasonable substitute for wood and, accordingly, a decision was made to proceed with the design and construction of a concrete pole on an experimental basis.

The Florida Power Corporation, when it started its research, could find no recently published data on the design or use of concrete poles on power lines. However, literature on the subject was obtained from France, Italy, Germany and Mexico, where some work had been done along this line.

What evolved was a design for a 35-ft. tapered concrete pole with an octagonal section 29-ft. long, topped by a round 6-ft. section. The diameter between flat surfaces of the octagonal section at the bottom is 1 ft. and the outside diameter at the top is 6 in. The pole is hollow, the inside diameter at the bottom being 7½ in. and at the top 1½ in. A reinforcement cage is used, consisting of twelve ¾-in. rods, four of which are 35 ft. long, four are 30 ft. long and four are 25 ft. long. Preformed spacers of No. 10 steel wire are used to hold the cage in shape.

The poles were fabricated by Mills & Jones, general contractors of St. Petersburg, Fla., who used a demountable steel form. The reinforcing cage was positioned on a flat section of the octagonal portion of the pole and the remainder of the form was assembled around the reinforcing cage. A steel mandrel was run through the cage to form the hollow center. Concrete was poured through the top

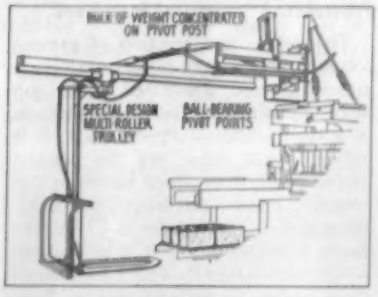
(Continued on page 164)

Casting yard showing reinforcing being placed in mold, a poured mold, and one of the finished poles ready for removal from mold

NEW MACHINERY

Fork Truck

MERCURY MANUFACTURING CO., 4044 S. Halstad St., Chicago 9, Ill., has brought out a 6000-lb. capacity fork truck, designated "Yank" Model 630. It features a two to one low-pressure, hydraulic hoist system which employs a single, simple acting hoist cylinder of short stroke for operator visibility. The hoist assembly also features a patented balanced cross-suspension to eliminate side forces when handling off-center loads. The drive axle assembly features a universal joint connected drive motor; seat-actuated Timken duo-grip mechanical parking brake operating on an intermediate gear shaft extension; self-centering hydraulic brakes; and detachable drive wheel rim and tire assembly. Magnetic contactors and control valves are panel mounted and accessible by removal of a single cover. Alemite Accumeter centralized lubrication is optional.



Concrete Block Hoist

BERGEN MACHINE & TOOL CO., INC., 189 Franklin Ave., Nutley 10, N. J., has brought out a lightweight, concrete block hoist for installation on Tri-Matic or Vibrapac concrete block machines. It can also be adapted for other production-type block machines. The hoist mounts on a pivot post for side movement, and features precision ball-bearing wheels, on a tubular track. A built-in stabilizer rib is incorporated for parallelism, and the fork plate is not tipped forward after unloading. The standard model requires 13 ft. of head room, and air consumption is the same as for other conventional hoists.

Reinforced Abrasive Blades

CLIPPER MANUFACTURING CO., 2800 Warwick, Kansas City 8, Mo., has developed "Polk-A-Dot" break-resistant abrasive blades for masonry cutting. The blades are reinforced to the cutting edge with glass fiber webbing, with extra reinforcing on both sides at the hub. Both sides of the blade are symetrically covered with raised abrasive "polkadots," each acting as an extra cutting edge. In standard sizes, 12-, 14-, and 18-in. diameters, the blades are available in a range of specifications for cutting hard to soft masonry materials.

Ready-Mixed Concrete Carrier

OSHKOSH MOTOR TRUCK, INC., 2300 Oregon St., Oshkosh, Wis., has announced the Model 50-50 four-wheel drive ready-mixed concrete carrier, designed to carry a payload of 18,000 lb. on each axle. The engine is cantilevered forward of the front wheels for easy access to the engine. The carrier has a 144-in. wheel base and is equipped with Vickers power steering which acts directly with one drag link. The four-wheel drive provides traction for spotting loads without building temporary roads. It hauls up to 5 cu. yd. per load, with sufficient water for ready-mixed concrete operation.

Moisture Control Unit

EDICK LABORATORIES, INC., Electronics Div., 427 W. National Ave., Milwaukee, Wis., has announced an automatic, electronic moisture control unit for concrete products plants. A switch activates the unit to read and measure the moisture content in each batch before water is added. The unit then automatically computes and places the proper amount of water required. Once the unit is set, it is said to maintain any consistency desired in the operation.

Small Size Boiler

CYCLOTHERM DIV., National-U. S. Radiator Corp., Oswego 5, N. Y., has developed a compact 50-hp. steam generator designed to burn No. 4 oil. It can be installed in 20 sq. ft. of floor area, and requires 4 ft. 8¼ in. of head room. No concrete foundation is required. It is said that fuel costs may be cut as much as 30 percent, due to the price differential between No. 4 residual oil and light oils. The boiler is claimed to operate at efficiencies of 80 percent or better.

Ponca City, Okla., high school stadium. Prestressed concrete beams up to 65 ft. long support precast decks which carry precast concrete seats

Pryor, Okla., high school gymnasium has 100-ft. cast-in-place, prestressed beams

Prestressed Concrete Stadia and Soffit Block Construction

• P. F. Blair and Son, Tulsa, Okla., has specialized in precast, prestressed concrete for bridges, schools, homes and industrial buildings. Company specializes in school stadiums

By TIP BROWN

FOR THE PAST TEN YEARS, P. F. Blair and Son of Tulsa, Okla., concrete engineers, manufacturers, and contractors, have been engaged in a variety of activities in the precast and prestressed concrete field that have resulted in wide use of concrete units. The beginnings were in the production and erection of precast concrete stadia and the later application of prestressed beams to this construction. In the western part of Tulsa, on an eight-acre site, is located the company office and plant at 2902 West 41st street. It includes a shop building, well equipped for the company's casting enterprises, which involve a large amount of roof units for schools, churches, industrial, residential and commercial buildings and special sections for bridges.

Precast Concrete Stadia

The Blair company, which invented and patented a precast concrete stadium design, has built some 50 stadia over the country. In recent years, the patent was sold, but the company retained the right to operate locally in this field. Last year, school jobs with prestressed beam supports were erected at Texarkana, Texas, 8000 seats; Ponca City, Okla., 3000 seats; Oklahoma City, Okla., 2000 seats; and Tulsa, Okla., 600 seats. The beams averaged 35 ft. to 65 ft. in length, and support precast decks which in turn carry the precast concrete seats. Column supports are 16- x 16-in. cast-in-place concrete. A striking illustration, herewith, shows the stadia job at Ponca City. Construction cost was $12 per seat and, by way of comparison, steel bleachers were bid at $17 to $19 per seat and cast-in-place concrete at $25 and up per seat.

Two views of soffit block roof construction

Prestressed Structural Members

The design and erection of precast columns and cast-in-place prestressed girders is best illustrated by a job nearing completion for the gymnasium of a high school at Pryor, Okla. It is believed that these are the longest cast-in-place, prestressed beams in this country. The overall length is 100 ft., the width of each girder is 24 in., the depth at midspan is 5 ft. 9 in. and the weight is 100,000 lb. There are four of these girders in the roof section. Concrete was designed for 5000 p.s.i. and prestressing consisted of 112 wires of ¼ in. with an initial prestressing force of 802,000 lb. The accompanying illustration shows the small amount of shoring involved in the erection. The architect for the building is Conner & Pojezny, Oklahoma City, and the general contractor is Grammer Construction Co., Tulsa.

A showy part of the Blair operations is the method of transporting

long-span roof channels across town and country by truck. The spans have an overall depth of 9½ in., web sections of 2 in., and they usually are 25 ft. in length. They weigh 34 lb. per cu. ft. or about 1800 lb. per unit of 25-ft. length. Made with lightweight aggregate, they are used on all types of roofs for industrial, residential, and commercial jobs, and are placed on beams or bearing walls with rigid insulation on top and conventional built up roofing.

A growing demand for bridge units is creating a new outlet for prestressed construction. The company is now supplying precast channels for the floor system of a bridge in Tulsa County with girders 16 in. wide by 36 in. deep and 59 ft. long. They weigh ten tons each and are precast, and prestressed with 49 wires stressed to 6100 lb. per wire.

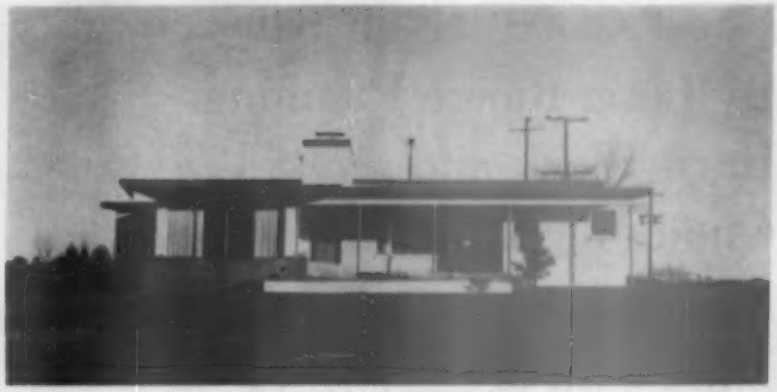
Soffit Block Innovations

Application of prestressing to soffit blocks has created new uses and considerable savings in dead weight where lightweight aggregate is used. Prestressing has the effect of transferring a portion of the load to the block which ordinarily are space fillers. Elimination of shoring is estimated to save 50¢ per sq. ft. In the prestressing process, the soffit blocks are laid on a pallet which has been leveled and made into plank formation. Either two or four wires are used, depending upon the length of span in which the planks will be utilized. The wires are stressed to 7100 lb. each and a crane is used to set the planks in place.

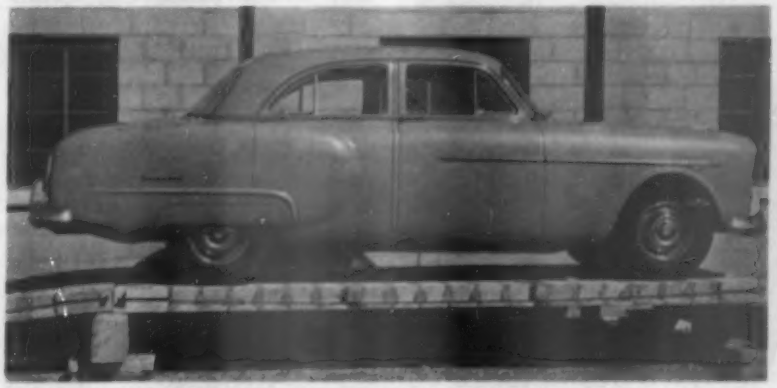
An interesting test is illustrated herewith in the photograph showing a 4000-lb. automobile which was driven upon a two plank runway and came to rest with the weight equally distributed over the four wheels and at an equivalent of 20 lb. per sq. ft. There was no measurable deflection. However, earlier in the demonstration, when the car was midway on the planks, at an equivalent live load of 50 lb. per sq. ft., there was a slight deflection. The design consisted of four ¼-in. wires stressed to 7100 lb. per wire. Ordinary use of this design would support a load of 80 lb. per sq. ft.

Soffit block are now being used in Tulsa for residential roofs and floors, thus making possible a completely fireproof structure where concrete floors and block walls and partitions are used. A fine example is the new concrete masonry home of Douglas O. Johnson in Tulsa, in which front and side elevations and a close up of the soffit block roof are illustrated. The exterior of the house is of concrete masonry painted a peach color. The soffit block roof, one of the first in the area, is of prestressed soffit planks. The roof is pitched at the rear of the house with a 3-in. to 12-in. slope and provides a roomy carport. The front roof section is flat with 1-in. rigid insulation and conventional built-up roofing. Acoustical plaster was applied upon the under side of the roof. The total roof area is 3400 sq. ft., which includes the overhanging eaves. The house cost approximately $30,000.

Among the many advantages favoring concrete masonry house construction is the excellent fire rating that can be obtained locally by classification under the 4-hr. fire rating and the attendant saving in fire insurance premiums. The total annual premium for extended coverage on this house is only $14.



Front elevation of residence in Tulsa, Okla., constructed with soffit block



A 4000-lb. automobile tests prestressed soffit block planks. Either two or four wires, depending on length, are each stressed to 7100 lb.

Concrete Inspection Manual

AMERICAN CONCRETE INSTITUTE announces a new edition of the "ACI Manual of Concrete Inspection." The 232-page pocket-size manual describes inspection methods generally accepted as good practice in the concrete construction industry. It is intended as a supplement to job specifications and as a guide in matters not covered by them.

Prepared under the direction of J. W. Kelly, author-chairman of the ACI committee on inspection, this third edition incorporates constructive suggestions offered during 14 years of continuous service of the original 1941 edition. Additional material included in the new edition covers such subjects as air entrainment, ready-mixed concrete, and the latest special concrete construction methods. Chief feature of the new edition is a general expansion of explanatory matter so as to be of greater use to the inspector.

Varied Uses of Block

BESSER COMPANY, Alpena, Mich., has published an attractive 24-page booklet showing the many uses of concrete masonry units in home building. Both interior and exterior uses, in color, are shown. The book, available without cost, helps home builders to make the most of modern concrete masonry.

Precast Panels

VENICE PRE-CAST CO., Venice, Fla., has opened a plant in Venice producing lightweight precast concrete wall panels. Officers are Clarke Wilmot, president, Eric Joelson, vice-president, and Carl Blizzard, secretary-treasurer.

Boost CONCRETE Sales By Long Range Planning, Hard Work and Good Merchandising

• Barry O'Leary, Inc., Billings, Mont., starting operations with a pick, shovel and bicycle in 1918, has grown to one of the largest ready-mixed concrete and sand and gravel producers in the state

By L. A. CASTELL

Colorful, animated neon sign, visible over a wide area, located atop general offices, stockroom and truck storage building

STARTING IN BILLINGS, MONT., in 1918 with a pick, a shovel, and a bicycle, the late Barry O'Leary developed his company, Barry O'Leary, Inc., into one of the largest concrete firms in Montana with a yearly value of $750,000 and equipment inventory of $400,000. He started the Billings Sand & Gravel Co., and became half-owner of the Billings Construction Co. Another ready-mixed concrete plant at Laurel, a railroad-oil refining center 15 miles away, was recently completed.

Born in County Cork, Ireland, Mr. O'Leary died on July 27, 1953, at the age of 62. But the corporation has continued under its present name, and further expansion is in prospect. Mrs. O'Leary, his widow and office manager, is the main stockholder. Tom D. O'Donnell is estimator and engineer, and there is a loyal staff of employes, some of whom have been with the organization 18 to 25 years.

Long range planning, hard work, and good merchandising are the main factors in this success story. Mr. O'Leary foresaw the possibilities of ready-mixed concrete as early as 1922, and built a small plant virtually with his own hands. It was the first in Billings. Material was sack-handled, but the plant ran from morning to night and put out 75 cu. yd. of concrete a day. In 1946 it was replaced by a new 300 cu. yd. bulk batching plant, about half a mile from the main office and yard.

Three years ago, O'Leary's was the first in town to furnish ready-mixed vermiculite insulating concrete. "We think lightweight has a good future," Tom O'Donnell commented. "Architects are specifying it more and more, and it is bringing us insulation business, such as roof decks, we wouldn't get otherwise."

Getting in on the ground floor is a company policy. The Laurel plant was opened because the town is rapidly becoming an important refining center for the Montana oil fields.

Standing ahead of front-end loader are left to right: Tom D. O'Donnell, estimator and engineer; Mrs. Barry O'Leary; and Mrs. Joyce Cook, secretary. Building in background is maintenance shop

Diversified Operations

Besides ready-mixed concrete, the firm handles washed sand, plaster sand, concrete sand, ½-in. to 2-in. gravel, crushed rock, blacktop and "niggerhead" boulders used for septic tank and ditch drains. In the early days, business consisted of digging sewers by hand, buying and selling sewer pipe, and laying sidewalks for householders. This has been expanded into a profitable contracting side-line.

"We don't put up complete buildings," O'Donnell explained. "To sell as much concrete as we put out, we couldn't compete with the construction companies and still sell them concrete. We're careful not to step on the other fellow's toes. But we do go into concrete form work, excavating, and sewer and water lines, furnishing both

labor and material. We've been doing city concrete work for so many years that everyone just expects we will continue, and they still buy from us as long as we don't bid on a complete building."

Equipment for this end of the business includes four power shovels (three Link-Belt and one Quickway, mounted on a Studebaker); one Caterpillar and two International bulldozers; two Caterpillar motor graders; and five loaders: a 1½-cu. yd. Pettibone, 1½-cu. yd. Hough; 1-cu. yd. Allis-Chalmers 5, 1-cu. yd. DR Caterpillar (all front end loaders); and a bucket-type overhead Eagle unit.

The Billings Sand & Gravel Co. operates four pits. Equipment includes two Pioneer crushers, capacity 75 cu. yd. per hour; six dump trucks, and four pickups. The original gravel pit covering 30 acres was depleted some years ago. This ground has now been leveled and will soon be opened as the Boot Hill Subdivision, with 30 ranch-type homes in the $20,000 class, which will be built for the corporation.

Radio and Magazine Advertising

Promotion includes extensive radio programs and ads in contractors' magazines throughout the state. Spot announcements are used at least once a day every day in the year. The firm sponsors an annual St. Patrick's Day program and programs of Billings Central High School. The Laurel plant was opened with a fanfare of special newspaper and radio advertising and publicity stories.

Other advertising media include sponsorship of hot rod races and a ladies' bowling team which captured two city championships last year. There is active participation in civic events, and O'Leary floats are entered in every parade, always featuring a pick, a shovel, and a bicycle.

Thirty-two smartly painted moving vehicles carry the O'Leary name all over town. Visible at night from the surrounding rimrock and almost anywhere in the city is an animated neon ready-mixed truck atop the main yard, put up about a year ago, which has created a great deal of comment. A similar sign will be installed at Laurel. Special services have built up an enormous amount of good will and word-of-mouth advertising.

The ready-mixed concrete plant furnishes "pickup" ready-mixed concrete for householders who want to put in bases for clothes line poles or lay a small section of floor or sidewalk. The customer brings his own tub, and the concrete is measured by weight into fractions of a cubic yard. Sacked sand for children's play boxes is also available.

O'Leary's offer free estimating service, and will even work out special problems, such as how much weight a privately owned bridge can support to get a load of concrete delivered.

Bulk batching plant and part of the truck mixer fleet at Billings, Mont.

Good Neighbor Policy

In winter the bulldozers clear roads and driveways for the city, home owners, and ranchers. This service is particularly valuable to the ranchers, since it assures getting feed in to cattle no matter how deep the snow.

Snow clearing also keeps the employes busy during the three slow months of winter. The crew numbers between 60 and 75 men, with an annual payroll of $185,000. As already indicated, employe relations are excellent. The company pays the entire premium for group health, accident, and life insurance. Each year in June, branding day on the 3000-acre O'Leary ranch is marked with a large party for employes and friends, and the men have their own lunchroom at one side of the main office.

The Billings ready-mixed concrete plant includes a Noble bulk batcher. The tower, 65 ft. high, is fed by a Pioneer conveyor. Overhead storage consists of two sand and two gravel bins, steam heated in winter, with a total capacity of 40 cu. yd. of sand and 80 cu. yd. of gravel. Cement storage hoppers at ground level have a capacity of 3000 sacks. Bulk cement is unloaded by screw conveyor and elevated by conveyor. A large semi-trailer will be purchased to haul cement from Trident, about 250 miles away.

This plant is served by a fleet of ten mixer trucks: three 2½-cu. yd. and one 4-cu. yd. Rex; two 2½-cu. yd. Jaeger; one 3-cu. yd Tri-State; one 6-cu. yd. and one 4-cu. yd. Blaw-Knox; and, the latest acquisition, a 7½-cu. yd. Smith. The trucks are International, White, Mack, Diamond T, Dodge, and Ford.

Each driver washes his equipment once a day as soon as pouring is finished. Greasing is handled by a full-time man in the company's shop, where all equipment is maintained in top-notch condition by two mechanics.

(Continued on page 154)

Corner of modern maintenance shop where all equipment of the company is repaired and serviced. Welding equipment is available for truck repairs

Leadership

In every field there is a leader...a product that stands out...a company that originates and develops the new and improved methods that lead the way to greater profit for the user.

In the field of truck mixers, this leader is Rex®. The new and the better is expected of Rex. The boldly original creative abilities of Rex engineers have been responsible for virtually every important development in truck mixers. For example, more than a quarter century ago, Rex introduced the chain drum drive... today an accepted basic element of good truck mixer design. More recently, Rex engineers created one of the greatest developments in truck mixer history...the Adjusta-Wate design principle that leads the way to more profitable ready-mix operations.

Leadership brings with it a responsibility...an obligation to continue this forward thinking...to keep working toward the goal of even better machines and greater operating efficiencies. Too, leadership has its liabilities. The leader must always go ahead...to be willing to expend the time, effort and money to speed industry progress ...and to be willing to face the combined resistance of those who follow.

This forward look...this imaginative engineering...this willingness to shoulder the burden of leadership...is your best reason for looking to Rex, the leader, for the answers to your truck mixer problems. Your local Rex Distributor will be happy to discuss them with you. CHAIN Belt Company, 4649 West Greenfield Avenue, Milwaukee 1, Wisconsin.

Rex Adjusta-Wate Mixers are available in 3½, 4½, 5½, 6½ and 7½ yard capacities with a wide range of accessories and optional components to fit any pocketbook.

CONSTRUCTION REX MACHINERY

Adjusta-Wate Moto-Mixers®

LEADERSHIP...THROUGH CREATIVE ENGINEERING

CHAIN BELT COMPANY

Precast concrete structural member being transported from plant to storage with the aid of travelling crane and hoist. Slings holding precast concrete unit are hooked at each end of lifting bar which in turn is attached to hook on hoist pulley

SLINGS

For Handling Precast Units

By JOHN C. APPLEGARTH*

PRECAST CONCRETE structural units are often cast with hooks permanently fixed in the assembly for easy removal from the mold with an overhead chain hook. Other types, however, are not cast with hooks in the assembly and it is necessary for the manufacturer to lift such units by slings.

In the selection of the type of sling to be used, the extremely abrasive condition of the precast units is a major problem. Since these structural members are heavy and offer a combination of both abrasive flat surfaces and sharp edges, it is necessary that a type of sling be chosen that can withstand the abrasion and weight combination.

Some types have not been able to withstand the cutting action of the sharp edges. Others, although not injured by this cutting action, have crushed or broken edges or surfaces, thus rendering the piece inferior and unsalable.

The Arnold Stone Co., Greensboro, N. C., has been using a new type of sling that has proved satisfactory for over two years. It is called the Gripper woven wire sling. It is constructed by weaving together sections of spiral wire loops which are joined across the body of the sling to provide a broad, flat bearing surface for the load. With this spiral wire loop construction, the sling bends along its width as well as along its length. Thus, it grips tightly around sharp edges but will not crush the edges or mar flat surfaces.

Arnold Stone Co. is using woven wire slings for handling such items as joists, column struts, and large lintels. As shown in the accompanying illustration, short lengths of woven wire slings are suspended at either end of a spreader bar which in turn is suspended from an overhead monorail hoist. The woven wire slings are used in a basket hitch; that is, with both handles on the hook, to gain use of the maximum strength of the sling. Another method employs the choke hitch; that is, with the male handle passed through the female handle and attached to the lifting hook. This hitch gives the user the benefit of the maximum gripping power as the sling bends entirely around the circumference of the load.

Prior to the adoption of the woven wire sling, Arnold Stone Co. was using leather slings. Leather, of course, would not indefinitely resist the cutting and abrasive action of handling the concrete shapes, and thus the hazard of a sudden break and possible injury to employes was always present, and only continuous safety measures prevented serious accidents.

This type of sling provides substantial cost savings over a period of use although the initial cost of new woven wire slings is appreciably more than other types. The woven wire slings, however, require far less repair.

Besides this saving in actual cost, this company estimates that almost $500 a year is saved in labor because the woven wire slings are easier to hook up and can be used for carrying heavier loads.

*Cambridge Wire Cloth Co., Cambridge, Md.

Prediction of Compressive Strengths of Mortar—Concrete

By F. O. Anderegg

COUNT CZERNIN reports that the water-cement ratio may be used to predict 28-day compressive strengths from the seven day values.

Four-inch cubes were molded and cured in fog at 20 deg. C. He worked with 20 Austrian cements, some being portlands, some iron-portlands, and some of high early strength. At 28 days the strengths were equal to those at seven days with a water-cement ratio reduced by 0.15.

For instance, 28-day strengths for a given mix with the water-cement weight ratio of 0.6 were in good agreement with seven day strengths, where the ratio was 0.45. This relationship was confirmed with eight-inch cubes. It is hoped to determine what storage temperature will yield three-day strength equal to seven-day strengths stored at 20 deg. C. *(Zement-Kalk-Gips* No. 12, p. 460, 1954)

Promote Model Home

NATIONAL CONCRETE MASONRY ASSOCIATION, in its Promotion Bulletin No. 24, offers many hints and suggestions for building a model home. The report points out that the model home, if properly built and advertised, is an effective way to promote the use of concrete masonry. Major suggestions include enlisting a well known local architect to design the home and promoting the project through radio, TV, newspapers and other media.

Boost Concrete Sales

(Continued from page 151)

The entire fleet of vehicles is completely over-hauled, under-coated, and spray-painted once a year, a professional sign painter coming in to do the lettering.

The $35,000 batching plant at Laurel is a Heltzel with a capacity of 240 cu. yd. a day. Overhead bin storage is 20 cu. yd. of sand, 35 cu. yd. of gravel, and 200 sacks of cement. Washed sand is hauled to Laurel from the O'Leary pits in Billings. Other Laurel ready-mixed concrete equipment includes two Dodge trucks with Rex mixers. The Laurel operation is proving very successful, with considerable work coming in from the city. Laurel serves a radius of 75 miles; Billings, 100 miles.

HUSKY WHITE DUMP TRUCKS in the Varney fleet are like this Model WC2864-OH with 10-yard body with heavy-duty hoist, husky front axle, 11.00 x 24 12-ply tires, 176-inch wheelbase, 5068 transmission and SFDD4600 tandem rear axle with 9.02 ratio, inter axle differential.

Schedules UP... Operating Costs DOWN with WHITE SIX WHEELERS

VARNEY BROS., Inc.
Bellingham, Mass.
boosts loads
with WHITES

WHETHER it's sand and gravel or ready-mix, Varney Bros. Sand & Gravel Co. have stepped up schedules with White Six-Wheelers. Operating costs are down, too!

It's the same story across the country. The big loads, the tough trips, the tight schedules go by White . . . and leaders everywhere report that Whites cut operating costs, boost profits.

Find out for yourself! Get facts from your White Representative . . . today!

THE WHITE MOTOR COMPANY
Cleveland 1, Ohio

MINIMUM MAINTENANCE— White Mustang Engines have plenty of power for outstanding performance, Donald A. Varney, president, reports.

"Whites assure us economical operation of our truck fleet," he says.

BIGGER LOADS— Treasurer Clarence E. Varney says this fleet of 19 Whites cuts costs . . . boosts deliveries. Bigger payloads important for more savings.

TWO MORE WHITES —Two more White Six-Wheelers have just been added to the Varney fleet to keep up with demands for concrete for construction according to Richard Varney, vice-president.

FLEET OF WHITES keeps rolling! Here is part of the Varney ready-mix fleet which operates in the heart of Massachusetts. Varney has boosted body capacities substantially and the Whites are rugged and ready to go with those bigger payloads.

White

FOR MORE THAN 50 YEARS THE GREATEST NAME IN TRUCKS

SIGNS

Their Most Effective Use In Selling Concrete Products

By ERNEST W. FAIR

OUTDOOR ADVERTISING has become so important in selling concrete products that a knowledge of the basic principles is a definite "must."

Requirements, such as locations on good highways near the distribution areas, selection of colors which can be read easily and at a distance, spotting them where they can be easily seen, and the use of eye-catching words, are not enough to assure a maximum return from an investment in signs.

Take, for example, the sign shown in Fig. 1. It illustrates the importance of maintenance even though it is an extreme example. A sign like this is utterly valueless. A sign in readable condition, but shabby and unkempt, is even worse for it advertises the product as in all likelihood as bad as the sign itself.

A monthly check-up on every sign should be made by a member of the company staff. Even if the company has a sign maintenance contract, a regular check-up is in order.

It costs very little to touch up signs. In fact, if it is done often enough, an ordinary maintenance man can do the job. This applies not only to painting but to maintenance of the wood and metals and sign-mounting as well, and particularly to keeping grass, weeds and shrubs from obstructing even the smallest part of the sales message.

Another condition to guard against, particularly on small signs, is the danger of becoming buried in a cluster of other signs. If a sign is up front, it has retained its effectiveness. In every such cluster, the sign up front is easily read even at some distance, but if it is in the third or fourth spot its effective value falls almost to zero. The motorist driving at from 50 to 80 miles an hour can receive an impression only from the first such sign; he or she will seldom even attempt to note the others in the cluster.

When the initial placing of the sign was made it may have been all alone. But, as months went by, other signs were planted around the location and it became completely "boxed" in. The monthly inspection trip on such signs will discover this as soon as it happens. The location of such a sign should be changed immediately, unless it is still the first one of the group within the cluster.

Another often overlooked factor of great importance is the size and shape of the sign. The next time you drive along the highway, observe the monotony of the conventional 24-sheet size boards and note how little they impress you. You will also find that any sign which varies in size or shape from this familiar pattern attracts your attention, simply because it is unusual.

Fig. 1: An example of bad sign maintenance. The condition of this sign makes it worthless to the advertiser

Fig. 2: This is an excellent sign as it breaks away from conventional rectangular shape and therefore attracts more attention from motorists

Fig. 3: This sign is effective because of the large lettering and the cartoon type of presentation

Fig. 2 shows such a sign. It is effective because it varies from standard size and because it breaks away entirely from the conventional square or rectangular shape. Note also that a little extra was spent to mount it better than average, thus providing protection from bushes and weeds growing at its base. The outline of the silo on the sign helps to break the straight line and makes the sign as a whole more attention compelling.

A long and narrow sign also breaks away from the conventional shape. It has been designed to stand out because of the very nature of its construction and its contrast in shape with other signs nearby.

Fig. 3 shows a sign which has several good features designed to provide eye-catching appeal. The cartoon angle and very large lettering, with just a few words to put over the message, give it very high attraction possibilities. Note the extra wide light strip at the base to set it off from the dark ground area.

Many otherwise effective signs reach only a minute portion of their available audience simply because they are set against the sky and blend right into it. In spotting signs, it is well to keep in mind that the motorist instinctively

(Continued on page 158)

PRESTRESSED CONCRETE
FOR HAMPTON ROADS CROSSING

Casting piles at construction site. The north approach bridge is 3250 feet long; south approach bridge, 6190 feet. Customer is the Virginia Department of Highways. General Consultants, Parsons, Brinkerhoff, Hall & Macdonald; Contractor, Merritt Chapman & Scott; Stressing and Casting Plant, designed by Freyssinet Company, Incorporated and Precrete Incorporated.

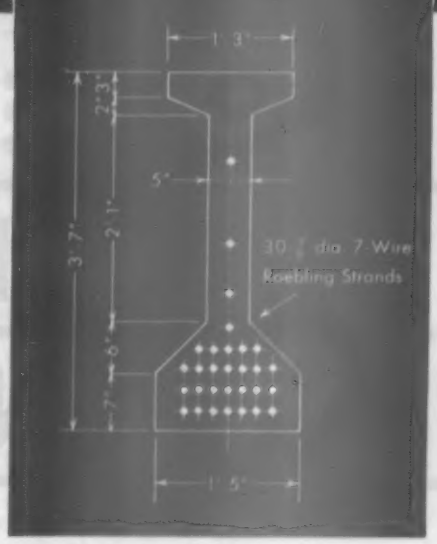
ON THE $19,500,000 bridge-tunnel project now under construction at Hampton Roads, Va., pre-tensioned bonded members are being used wherever the specification offers them as alternates to structural steel or post-tensioned members.

More than three million feet of Roebling ⅝" diameter 7-wire stress-relieved prestressed concrete strand are being used in piles and girders.

General technical data include:

Design load: H20-S16
Spans: 50'-0" c.c. pile bents
Girders: I section – 3' 7" depth at center and 3' 10" over piers on 5' 2" centers – each pretensioned with 30 Roebling ⅝" stress-relieved strands.
Piles: 24" square, 50 to 68 feet long with 10" cored hole, each pretensioned with 30 Roebling ⅝" stress-relieved strands. Five piles per bent, designed for two point pickup.

Roebling is America's leading supplier of tensioning elements, and Roebling engineers will be glad to give you full information on tensioning materials and fabrication methods. They are also ready to cooperate with you to help assure top efficiency on any specific application of this modern and economical structural material. Write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.



Cross section of girder at center of span.

ROEBLING

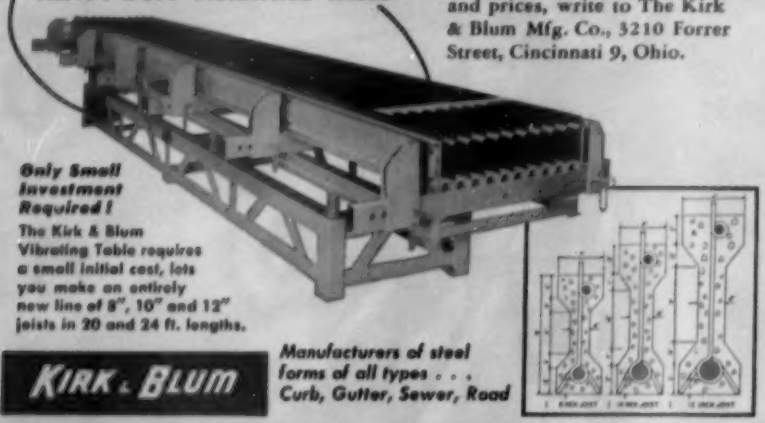
Subsidiary of The Colorado Fuel and Iron Corporation

Add a New Profit-Maker

increase your volume

PRODUCE CONCRETE JOISTS, LINTELS AND FENCE POSTS with the KIRK & BLUM HEAVY DUTY VIBRATING TABLE

Your experience in the building trade should make it easy to build up a profitable business in this new line. The products are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 3210 Forrer Street, Cincinnati 9, Ohio.



Only Small Investment Required!

The Kirk & Blum Vibrating Table requires a small initial cost, lets you make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.

KIRK & BLUM

Manufacturers of steel forms of all types . . . Curb, Gutter, Sewer, Road

Rotary

DRYERS

COOLERS

KILNS

Increase the capacity and efficiency of your plant

McDERMOTT BROS. CO.

THIRD AND WASHINGTON STS.

ALLENTOWN, PENNA.

Established 1895

Effective Signs

(Continued from page 156)

looks away from the bright sky while he is driving. Signs which blend into the sky are lost altogether as far as he is concerned.

Fig. 3 also shows how a sign can be placed to avoid all such troubles. The trees and shrubs serve to break the brightness of the sky when the sun is behind that particular sign. Note that it has been placed far enough away from the trees so that it will not blend into them and therefore lose its effectiveness.

Fig. 4 shows how a sign placed as close as possible to a roadside fence makes it appear larger and easier to see by the passer. This also lessens the chance of smaller signs being erected in front of it.

It often pays to use appendages to signs in order to put over specific points which may be lost if inserted in the general sign layout. In this particular sign the white strip at the bottom sets off the firm name very effectively.

Another factor of great importance is sign readability under the present high speed conditions. The majority of existing signs along our highways today were erected before the advent of super highways and fast traveling. Many now being erected still ignore these conditions. All of those shown herewith can be easily read under these conditions.

Here are some facts well worth keeping in mind:

1. Pick a good location where the sign will be seen by the greatest number of potential customers.

2. Check the background and be sure approaching cars have a clear view. Clean away weeds and brush that hide it.

3. Unusual shapes and sizes are better than the conventional rectangles.

4. Select bright, weather-proof colors and touch them up to keep them bright.

5. Keep your message brief. Use

Fig. 4: A sign placed close to a roadside fence makes it appear larger and it is easier to see

Your Customers will say...

when you offer them a choice of

23

DIFFERENT CEMENT & MORTAR COLORS

Made by Williams, this is the broadest selection of fine Cement and Mortar colors on the market. By offering your customers a choice of 23 shades, you can quickly and easily settle upon one having the exact chemical and physical properties your color specification requires.

CEMENT COLORS BY WILLIAMS

Here you have a choice of 18 shades —6 Reds, 3 Greens, 3 Browns, 3 Yellows, 1 Black, 1 Blue, and 1 Orange. Each shade is manufactured to meet the most exacting specifications for cement work—as recommended by the American Concrete Institute and the Portland Cement Association.

MORTAR COLORS BY WILLIAMS

Here you have a choice of 5 different shades — one shade in double strength red, light buff, dark buff, chocolate and black. Each of these colors may be used with excellent results with any standard mortar mix or with a ready-made Bricklayer's Cement.

Write today for color samples and complete technical information on how Williams Cement and Mortar Colors give you superior results. Address Dept. 10, C. K. Williams & Co., Easton, Pennsylvania.

WILLIAMS
COLORS & PIGMENTS

C. K. WILLIAMS & CO.
East St. Louis, Ill. Easton, Pa. Emeryville, Cal.

short words, large type. Change the wording or color scheme occasionally.

Remember, the purposes of these sign boards are to familiarize people with your business and your products and to invite inspection. If they are properly located and well planned, they are worth many times their cost. Regular inspection and maintenance will protect your investment.

Symposium On Winter Concreting In Denmark

THE 1956 RILEM SYMPOSIUM on "Winter Concreting — Theory and Practice" has been scheduled for February 13-18, 1956, in Copenhagen, Denmark by the Denmark National Institute, Building Research (under the auspices of "Réunion Internationale des Laboratoires d'Essais et de Recherches sur les Matériaux et les Constructions"). Neils Munk Plum, director of research of the institute, is chairman of the convention.

Among the speakers already scheduled are T. C. Powers, Portland Cement Association, Skokie, Ill., Edwin G. Swensson, National Research Council, Ottawa, Canada, and Mr. Plum. Topics scheduled for discussion include relation of weather conditions to concreting procedures, laboratory experiments on resistance of concrete to early freezing, influence of temperature on hardening of concrete, use of air entraining agents, methods for obtaining high quality concrete in winter, and winter concreting on the job site. The last two days of the meeting will be devoted to field trips to construction jobs in Copenhagen and in surrounding suburbs.

Concrete Improvement Boards

VICE ADMIRAL JOHN J. MANNING, C. E. C., U. S. Navy, retired, and managing director of the Concrete Industry Board of New York City, was the main speaker at the first meeting of the Concrete Improvement Board of Detroit. The Detroit group was organized "to improve the quality of concrete construction in the Detroit metropolitan area," and is modeled along the lines of the New York organization. Membership is open to any individual or firm "engaged in the design, construction, testing, manufacture and use of concrete or its component parts." Among projects being undertaken by the New York board, Admiral Manning said, are the establishment of standards of ready-mixed concrete operations and testing laboratories with a view of eventual certification. The New York group is also studying architectural specifications with recommendations toward a more uniform pattern, and is reviewing building codes.

COMMENT
from the
BUTLER ENGINEER

—of new world's records ... and tragedy

There's a Butler-built, barge-mounted concrete plant moored on the waters of Sault Ste. Marie. On its stern there's a big pennant (or there should be) bearing the words "World's Champ". It's a Merritt-Chapman-Scott job—*and that plant poured 6500 cubic yards in 24 hours.*

To me, Miami's heart is the unbelievably handsome, seven story building Maul Industries, Inc. has built for exec personnel. A superbly beautiful example in strikingly modern design, of the use of their own products—concrete block and pre-cast concrete structural members. It's worth a trip to Miami (Florida, that is) to see it.

Going back to world's records: told you earlier of one made with a Butler Roadbuilders Plant on the Ohio Turnpike. New figures just in are even better than quoted. The Sargeant Construction Company laid 4,368 lineal feet of 24 ft. pavement 10 inches thick in a 16 hour day, 2424 batches in all. That's better than 2½ batches per minute!

A tragic story. Visited a block plant in the South. A man working inside a concrete mixer had died horribly when someone turned the power on. There should always be a master cut-off switch nearby to prevent such accidents.

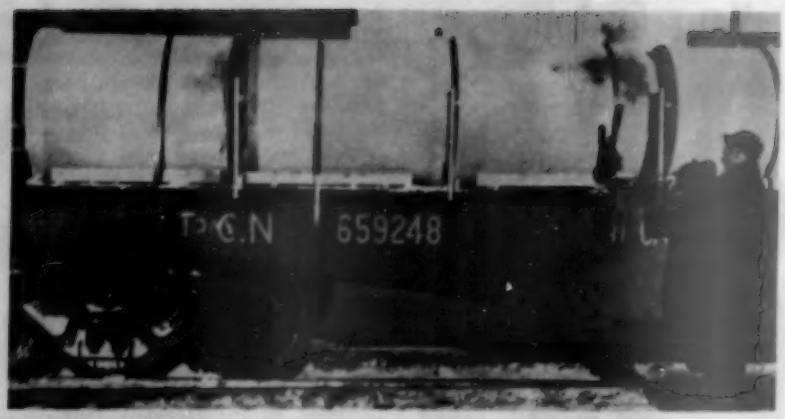
Told you earlier of a plastic coated concrete pipe used in sewage disposal, appropriately named Krapcote. I was asked to suggest a name for the device which puts the plastic on . . . Came up with "Kraplicator".

Be seeing you,

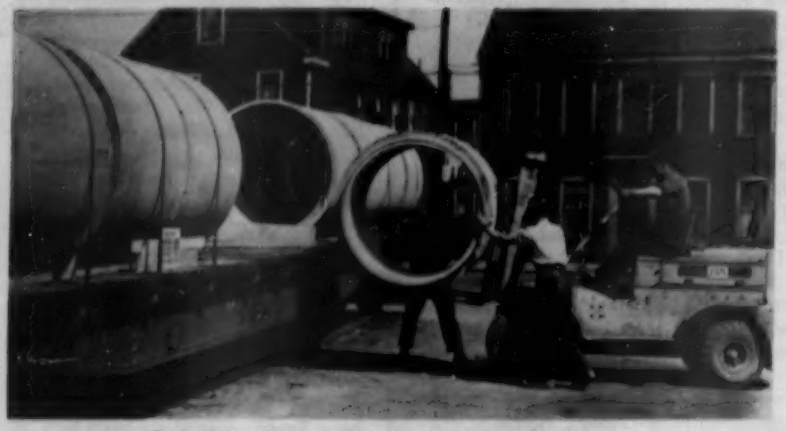
The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

Steel strapping being tensioned on a shipment of concrete sewer pipe



Worker is crimping the seal on the last section of sewer pipe to be loaded on this flatcar ready for shipment



Fork lift trucks move the culvert pipe onto the flatcars

Concrete Pipe Strapped to Flatcars

A NEW TECHNIQUE for strapping concrete pipe to flatcars has been developed by Jos. A. Likely, Ltd., St. John, New Brunswick.

This company makes concrete pipe to A.S.T.M. specifications for town and municipal sewerage and water drainage as well as for highway, railroad and airport culverts. Sizes range from 4 in. to 60 in. internal diameter with the small size weighing only 75 lb. per length, while the latter weighs in at 5120 lb. per length.

This firm uses steel strapping for all sizes of pipe with the small diameter pipe being strapped in boxcars, whereas the large diameter pipe is shipped on flatcars.

The old method used to brace the pipe in boxcars proved to be a costly and time-wasting shipping job.

The new shipping technique, developed in cooperation with Acme Steel Co., increased the amount of pipe loaded into a boxcar. The floating load system not only met the approval of the railway but decreased breakage to a minimum and reduced the time of loading by approximately 30 min. per car. Approximately 10 flatcars a day of large diameter pipe leave the plant during the construction season and, according to their records, more than 2000 carloads have been shipped without a single damage claim.

•

CRESCO READY-MIX INC. is building a ready-mixed concrete plant at Cresco, Iowa. This enterprise is a combined undertaking of two Cresco firms —Burgess and Sons Lumber Co. and Keune and Balk Limestone Co.

Production and Value of 1954 Ready-Mixed Concrete

NATIONAL READY-MIXED CONCRETE ASSOCIATION, Washington, D. C., has completed its fourth annual survey of the production and value of ready-mixed concrete. Reports from 1218 companies gave a 1954 output of 61,914,534 cu. yd., valued at $760,310,478, or an average value of $12.28 per cu. yd.

Questionnaires were sent to 1975 known ready-mixed concrete companies in the United States, and returns were received from 57 percent or 1129 firms; these include 521 N.R.M.C.A. member companies. (In compiling total production figures, the association was able to include statistics available on 89 member companies who did not return the questionnaire). Returns were obtained from 85 percent of the members, and 45 percent of the nonmembers.

The accompanying table compares the 1954 statistics with similar data obtained in the association's three earlier annual surveys. It is interesting to note that the average production per company in 1954 was 50,833 cu. yd., and the median production, 27,662 cu. yd. In 1954 the reporting companies used in excess of 82,000,000 bbl. of cement (30 percent of the annual cement output) and 103,000,000 tons of sand and coarse aggregate.

An analysis of the distribution of

(Continued on page 165)

Table 1 — Ready-Mixed Concrete in 1951, 1952, 1953 and 1954

	1951	1952	1953	1954
Companies surveyed	1635	1625	1791	1975
Companies reporting*	891	942	1013	1218
Production (cu. yd.)	37,760,191	49,165,443	53,404,513	61,914,534
Total value	$424,136,796	$564,861,162	$636,482,350	$760,310,478
Average value (per cu. yd.)	$11.23	$11.49	$11.92	$12.28
Portland cement consumed (bbl.)	50,873,199	62,297,152	71,082,222	82,546,330
Sand and coarse aggregate consumed (tons)	63,129,925	76,134,333	88,517,457	103,397,272
Average production	54,646	52,197	52,719	50,833
Median production	27,400	26,455	25,785	27,662

*1954 total includes 89 member companies not actually replying to the questionnaire but whose reports were otherwise available.

Another BESSER Booster*

★ This is the 121st of a series of ads featuring leaders in the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

This chart graphically illustrates the progress of the company during the past 10 years.

Successful Block Plant in Vineland Steps up Production with VIBRAPACS

The history of the Ed Campbell Company, Vineland, N. J., is a story of constant growth. Organized in 1944, the first plant produced only 2000 block per week. Today, the company operates two large plants, with every modern facility to speed up production. Their Millville plant alone has a capacity of 25,000 — 8″ block, or equivalent, per day.

Besser Vibrapacs are playing an important role in the success of the company. Each Vibrapac machine is fully automatic and is electronically controlled to produce quality block. The high production of Vibrapac machines, and their day-in, day-out dependability, are helping the company to forge ahead.

The Campbell executive team — (Left to right) John Courter; Joseph Darby, General Manager; George Courter; and Ed Campbell, Jr., President and Founder of the Company.

Two Front Pallet Feed Vibrapacs installed in the new Millville plant, in 1952.

Part of Plant No. 1, which includes the office and sales department — also South Jersey's first concrete masonry products quality control laboratory.

Aerial view of the new 15 acre plant at Millville, used primarily for the production of Waylite block. It gives the company greatly expanded facilities, including railroad siding.

Ask your nearby Besser Representative for Vibrapac literature, or write:

BESSER COMPANY • Box 135 • Alpena, Michigan, U. S. A.

Complete Equipment for Concrete Block Plants

BESSER VIBRAPAC

WORLD'S LEADING MANUFACTURER OF CONCRETE BLOCK MACHINERY

A 9485-1PBC

A ONE MAN...PLAIN PALLET BLOCK MACHINE

with advantages never before available... the

KENTWIN

WITH FRONT PALLET RETURN

With the KENTWIN having received favorable acceptance wherever introduced this front pallet return makes it an exceptionallypractical machine that should receive the serious consideration of everyblockmanufacturer.

Thorough investigation will reveal the fact that this KENTWIN combination embodies all the factors that assure large output at low cost and permit successful competition.

Ability to handle plain pallets of various sizes as small as 18″x 18″ makes it an unusually versatile machine.

Its compactness, accessibility, low power requirements and low upkeep should be of special interest.

Consider the profit possibilities with a new pallet-return-equipped KENTWIN or an automatic return on your present KENTWIN.

Ycu'll want the complete story of this remarkable development. Write today for Literature, Prices and Complete Details.

The KENT MACHINE COMPANY

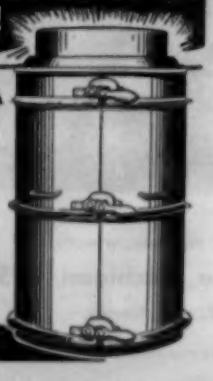
CUYAHOGA FALLS, OHIO

CONCRETE PRODUCTS MACHINERY SINCE 1925

Canadian Distributor: Wettlaufer Equipment, Ltd., 49 Merton St., Toronto 12, Ontario

FOR THE FINEST CONCRETE PIPE... YOU NEED FINEST FORMS!

The Quinn Standard



Backed by over 40 years of reliable service, the QUINN STANDARD is recognized as the finest concrete pipe form the world over. Thousands of pipe manufacturers, from the smallest to the largest, look to Quinn for equipment to produce the finest concrete pipe at the lowest possible costs.

• QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry process. Sizes for pipe from 10" to 120" and larger. Tongue and groove or bell end pipe in any length desired.

WRITE TODAY for complete information and estimates.

Also manufacturers of QUINN CONCRETE PIPE MACHINES

Quinn WIRE & IRON WORKS

BOONE, IOWA

KEEP ABREAST WITH INDUSTRY TRENDS THROUGH ROCK PRODUCTS

More Plants—Big Mixer Units

(Continued from page 145)

lation overflow. It is also well situated for rural and local oil production demands, and is in close proximity to the Beech Aircraft Corp., a major airplane plant.

The Selling Side

Heavy expansion of plant facilities is a sure indication that management feels confident of an increase in sales volume. The responsibility for this vital part of the business is spread among the entire organization to the end that all feel they are on the sales force. The nature of the ready mixed concrete business is such that sales result from personal contacts and services rather than through advertising practices current in retail operations.

Earl Henderson heads up the sales staff, and with his assistants pin-point new jobs from architectural and engineering sources and prepare work sheets on each piece of work, detailing quantities and delivery requirements. Specifications are a matter of intensive study to meet the variations of aggregate and other requirements affecting costs of production. Present practices of commercial laboratory sampling and testing on all major jobs is welcomed as an excellent barometer for retaining high quality standards in the industry.

All five plants are expected to be fully operating by March, 1956. Quite naturally, this arouses interest in the motives of the company in an expansion program that, aside from the operation of five mixing plants, includes sand and stone production for all of them and, in one instance, a water supply for a plant not reached by local water lines. Mr. Keeler has been living in sight of a forest of population growth for most of his years but feels he can still see the trees. Since 1940, the Wichita population has doubled, and now approaches 300,000, including the surburban areas. Ready-mixed concrete plants are sensitive to fringe growth as can be easily detected by analyzing the four new plant locations of the Keeler company. Suburban growth involves new volume and short hauls for the fringe located plant. The trend for neighborhoods to build up around new industrial developments works in favor of the ready-mixed concrete operator. Diversification of industry offers a good employment atmosphere and a tendency to encourage local expansion. Mr. Keeler has had unusual advantages in knowing his local situation by having served for four years on the Wichita City Commission and as Mayor during one of those years. He has made substan-

tial investments in other local real estate and business enterprises.

In no field has his company shown more initiative than in shifting with the passing years to innovations in the equipment field. Along with the adoption of the premix advantages inherent in the large central mixing installations, the company has aroused national interest in stepping up the mixer truck capacities.

Mr. Keeler expresses his thinking on this subject as follows: "Our changing economy dictates that we can no longer continue effectively in any trucking endeavor unless we step up capacities and efficiency over the methods of yesteryear. Highways built for the traffic of 10 to 20 years ago must be preserved as long as possible. This fact necessitates controlled axle loading; the only alternative left for the fleet owner is more axles and accurate load distribution. Ultimately, of course, many of our highways will become obsolete and will be replaced with heavier and better reinforced pavements. In the meantime, all fleet owners should strive diligently with all the ingenuity at their command to conform with the axle loading requirements as prescribed by law."

Reinforced Concrete Masonry

A STUDY OF THE STRUCTURAL PROPERTIES of reinforced concrete masonry is contained in a 167-page book, entitled "Investigation of the Structural Properties of Reinforced Concrete Masonry" by Professor Jesse C. Saemann. It pertains to a two-year study at the University of Wisconsin, which included tests of beams, columns and walls fabricated from concrete block, mortar, concrete core-fill and reinforcing bars. Materials and construction, test methods and results, and recommendations regarding design and construction procedures are given. Tables, photographs and dimensional details are also included. The book is available from the National Concrete Masonry Association, 38 S. Dearborn St., Chicago 3, Ill., at a cost of $1.50 to $2 per copy, depending on the size of the second printing.

"Build Better With Block"

COLUMBIA MACHINE, Vancouver, Wash., in its new, attractive handbook, "Build Better With Block," offers advice to concrete block makers in promoting their products. The book is available without cost to state and regional concrete masonry associations, to local unit masonry groups and to other block manufacturers. It gives simple suggestions for local programs of publicity, advertising and plant promotion, including such items as newspaper ads, radio and television.

YOU CAN BUY A BANTAM

ANY WAY YOU WANT IT!

There's a model Specially designed for Your jobs!

Whether you're loading out aggregates, feeding batchers or crushers, stock piling, or handling concrete, there's a BANTAM to fit the KEY SPOT on that job! Schield Bantam builds just one size machine . . . builds more of them than anyone else . . . builds them to do more jobs for you with any of 9 different attachments.

For special applications or routine jobs, there's a BANTAM that can do your work faster with more profit for you! Find out about a BANTAM before you buy any ⅜ yd., 5-6-7 ton shovel-crane!

WE HAVE A NEW 7 TON BANTAM

Now, to let you handle bigger lifts, Schield Bantam offers a 7-TON CRANE on Heavy-Duty "300" Crane Carrier! You can also get 5-ton (Crawler) and 6-ton (Carrier and Self-Propelled) cranes to fit your job needs . . . the most complete crane line-up in the ⅜ yd. field!

SP-12

Schield Bantam Co.

216 PARK ST., WAVERLY, IOWA, U.S.A.

WORLD'S LARGEST PRODUCERS OF TRUCK-CRANES AND EXCAVATORS

CLIP . . . Mail Today for more information about the BANTAM.

SEND INFORMATION ON:

- ☐ Name of nearest Bantam Distributor
- ☐ New 7-Ton Bantam
- ☐ Crawler Mounted
- ☐ Concrete Bucket ☐ Pile Driver
- ☐ Clam ☐ Crane ☐ Drag ☐ Shovel
- ☐ Back Hoe ☐ Backfiller ☐ Magnet

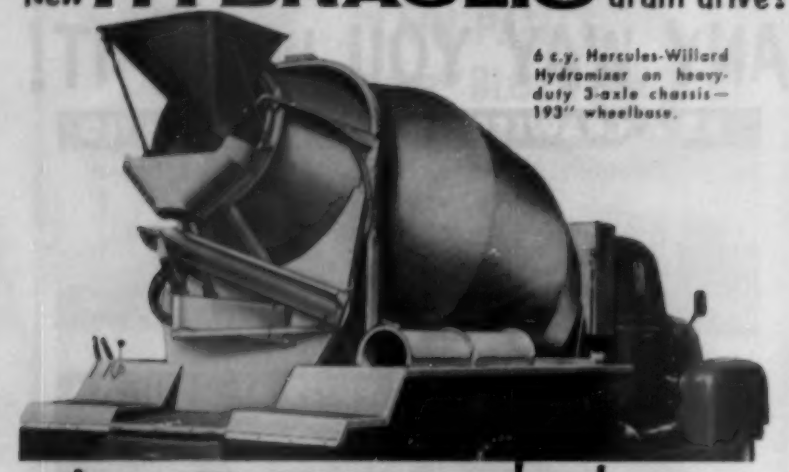
Name _____ Title _____

Company _____

Address _____

City _____ State _____

New HYDRAULIC drum drive!



6 c.y. Hercules-Willard Hydromixer on heavy-duty 3-axle chassis—193" wheelbase.

gives 7 BIG advantages...

1 **ELIMINATES EXTRA ENGINE**...no extra fuel costs...no extra weight ...no engine maintenance.

2 **SAVES WEIGHT**—complete mixer weighs only 7100 lbs.

3 **MORE PAYLOAD** because 6½ c.y. load puts less than 32,000 lbs. on rear tandem axles.

4 **HYDRAULIC DRUM DRIVE** is powered by front engine mounted, combination 2-speed power take off and pump. Completely enclosed.

5 **NO EXTRA CLUTCH** or gear box—merely a hydraulic motor driven 2-speed transmission.

6 **EASY CONTROL** by engine throttle and simple 2-way hydraulic valve lever which prevents surging and rollback.

7 **SAVES MONEY** directly in operating expenses and indirectly in down time due to mixer engine troubles.

GET THE FACTS by writing today. Dealers everywhere.

Manufactured in Los Angeles, California and Galion, Ohio Member: T.M.M.B.

WILLARD CONCRETE MACHINERY SALES COMPANY
11700 WRIGHT ROAD, LYNWOOD (LOS ANGELES COUNTY) CALIFORNIA

Hercules-Willard Hydromixer

COLORS

WHEN and WHERE you need them

For better service to our Eastern customers, we have established a branch plant and office at New Brunswick, New Jersey where our complete line of Cement Colors is now available.

Warehouses at all Important Points of Distribution

FRANK D. DAVIS COMPANY

2704 Santa Fe Avenue
Los Angeles 58, California

P.O. Box 292
Nixon, New Jersey

Prestressed Concrete Poles

(Continued from page 146)

side of the round and octagonal sections, using a 1:2:3 mix. Forms were stripped about 4 hr. after pouring. After the interior was filled with water, the top and bottom openings to the hollow section were then closed. Poles were cured for 30 days before installation. Galvanized sheet metal tubular inserts were set in the forms to provide for through-bolts for mounting insulators, crossarms, etc. The complete pole weighs about 2100 lb.

Tests develop a breaking strength of 2000 lb., applied 1 ft. from the top, thus making a safe working load of 1000 lb. The initial installation was on a causeway section of the new $22,000,000 Sunshine Skyway over Tampa Bay, a severe service area, where the poles will be subject to hurricane winds, salt spray and wave action. Under these conditions, the Florida Power Corporation believes that accelerated life expectancy data can be obtained. "The distribution line constructed," says Mr. McKean, "presents a much more pleasing appearance than a standard wood line pole. All poles are uniform in size and taper."

The concrete poles were set by the same methods used for setting wood poles. A normal-size pole-setting crew set an average of three poles an hour.

As a result of its success with these power line poles, Florida Power Corporation has set out an experimental installation of poles of the same design for street lighting use, which cost about one-third less than metallic poles, and, according to the company, "develop greater strength with equally satisfactory appearance."

Finished street light precast concrete pole

Ready Mix Industry Growing

(Continued from page 160)

production by company size indicates that the largest number of companies are in the four smaller brackets: 0-10,000 cu. yd., 269 firms, accounting for 2.6 percent of the total production: 10,000-20,000 cu. yd., 252 firms, accounting for 5.9 percent of output; 20,000-30,000 cu. yd., 169 firms, accounting for 6.7 percent of output; and 30,000-40,000 cu. yd., 131 firms, accounting for 7.3 percent of output.

Nine companies produced more than 500,000 cu. yd. last year, responsible for 13.5 percent of the total production. Less than 15 percent of the total yardage was produced by 50 percent of the companies representing the smaller one-half (i.e. below the median). Conversely the ten percent of the firms in the larger brackets (larger than 100,000 cu. yd.) accounted for 50 percent of the total output.

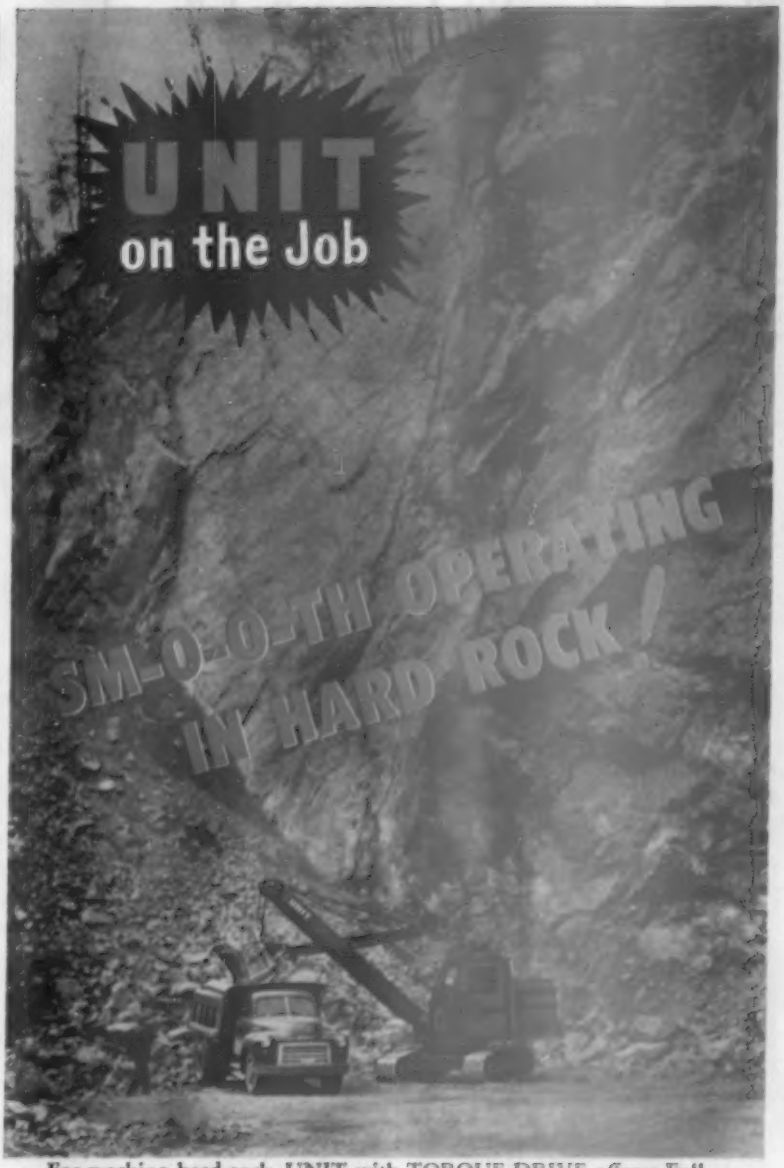
The survey also indicated that the 1129 compaines returning the questionnaire operated 14,609 truck mixers or agitators in 1954, or an average of 12.9 units per company. Proportioning plants were reported by 802 companies operating 1295 such plants, and central mixing plants were reported by 430 companies operating 552 such plants. The 1129 companies reported 2081 non-agitating units in operation, or an average of 1.8 per company. In 1953 the reporting companies operated an average of 14.3 truck mixers and 1.8 non-agitating units per company. The ratio of central mixing to proportioning plants in 1954 (for reporting firms) was 0.43 compared to 0.40 in 1953.

Slab-On-Ground Study

BUILDING RESEARCH ADVISORY BOARD began a four-month study in March, 1955, of slab-on-ground construction for houses, the study being made for the F.H.A. under contract with the National Academy of Sciences. Structural, moisture, and thermal properties are being studied to provide F.H.A. with usable data for setting up its technical standards for this type of construction.

New Rapidex Licensee

BALTIMORE CONCRETE PLANK CORP., Baltimore, Md., has signed a license with the Rapidex Corporation, subsidiary of Speckelmier Co., Indianapolis, Ind., to manufacture and sell Rapidex, a lightweight concrete sectional slab system for floors and roofs. The Baltimore firm will sell Rapidex in eastern Pennsylvania, southern New Jersey, Delaware and most of Maryland. Production will commence this summer.



For working hard rock, UNIT with TORQUE DRIVE offers: Full, steady power without stalling engine — Increased lugging power — Elimination of shock loads on machinery. Investigate these advantages and other UNIT features. Write for Bulletin No. U-1153.

UNIT CRANE & SHOVEL CORPORATION

6431 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.

½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL

All Models Convertible to ALL Attachments!

"Cleaned with a whisk broom, putty knife and . . .

EDI-COTE 103 in half the time!"

says owner* of this 17 year old mixer that looks like new.

EDI-COTE #103 is a revolutionary new release agent that prevents concrete from bonding to mixer blades and parts. EDI-COTE #103 eliminates the use of air guns and sledge hammers in the daily clean-up. EDI-COTE #103 creates a non-hardening film which prevents the forming of a bond between concrete and metal. It adheres rigidly and will not dissipate due to chemical action or abrasion. One application of EDI-COTE #103 will remain effective throughout the longest working day. EDI-COTE #103 can be applied with brush or spray. Shipped in 55 gallon drums. 5 gallon cans available for trial shipments only. Order EDI-COTE # 103 today!

* Frank Erdman & Son, Milwaukee, Wisconsin

Edick LABORATORIES
427 West National Avenue
MILWAUKEE 4, WISCONSIN

For further information on EDI-COTE #103, see your NCMA Technical Bulletin No. 2, Attachment No. 1, March 3, 1955.

COMPLETE PLANTS from a Single Source

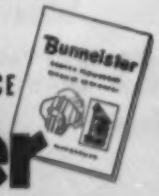
- "Tilt-Up" Mixers
- Ready-Mix Plants
- Expressway Semi-Portable Plants
- Dry Batch Plants
- Cement Bins
- Aggregate Bins
- Cement Storage

ENGINEERED TO WORK TOGETHER

From conveyor to elevator, from bin to mixer Burmeister equipment is designed and built by the same organization. Because each product is *"engineered to work together"* you are assured less costly "conversions," maximum production speed, accurate delivery of materials, and greater economy of operation. See your nearest Burmeister Distributor or write for details.

FREE CATALOG

Send for new 16-page illustrated Catalog of Burmeister Plants and Equipment.



COMPLETE PLANTS FROM A SINGLE SOURCE

Burmeister

L. BURMEISTER CO., 4529 W. MITCHELL ST., MILWAUKEE 14, WISCONSIN

PRECAST CONCRETE

By HUBERT C. PERSONS

DR. KURT BILLIG'S LATEST BOOK, "Precast Concrete,"* expresses the author's belief that the most economical use of precast concrete in a structure depends on a proper balance between precast units and cast-in-place concrete. The book is based largely on European practices although frequent references are made to such American developments as large-scale Tilt-Up wall construction, sandwich walls and to work of the American Concrete Institute.

The author suggests that the main claims for precast concrete construction are speed, saving in formwork and scaffolding and the economy gained by the use of machinery for manufacture and construction. He says that precasting has not gained acceptance as rapidly as might be expected, and believes this is due to the fact that too little attention has been paid to the influence of repeated handling and transportation of the units on the cost of the work.

Dr. Billig declares that precast reinforced concrete has proved a definite success where structures are erected by combining precast units and cast-in-place members. He feels that although much has been written about precast concrete not enough attention has been given to the results obtained by combining the two methods. The purpose of the present book, he says, is to fill this gap by collecting "characteristic examples in the various branches of engineering and to represent them as a complete review of the manifold uses of this method."

The book is in four parts. Part I discusses fundamentals such as methods of design, production processes, forms, curing, plant layout, transportation and erection, and efficiency. Part II deals with a wide variety of precast units for many different purposes. Part III goes into considerable detail about joints of various types, their functions and methods of construction. Part IV includes a survey of a great number of structures erected from precast units or a combination of precast members and cast-in-place concrete.

As might be expected from the author of a 1952 book on Prestressed Concrete, the present book has considerable to say about prestressing. In fact, the author believes that the advent of prestressing marks a turning point in the development of precast concrete. Prestressing, Dr. Billig declares, has opened the way to the use of precast concrete for numerous types

*D. Van Nostrand Co., Inc. New York, 1955. Price $7.50.

of engineering projects on which it would otherwise have been uneconomical.

One complete chapter in Part I is devoted to prestressing. The book is generously illustrated with design details and photographs of many types of construction in Europe.

Dr. Billig is internationally known as the author of many books and professional papers on concrete. He is a member of the Institution of Civil Engineers, London and the American Society of Civil Engineers. In 1952 he was appointed by the Indian Government as Director of the Central Building Research Institute of India at Roorkee.

Spancrete Machine Installed

WEST ALLIS CONCRETE PRODUCTS Co., West Allis, Wis., and Waukesha Block Co., Waukesha, Wis., have installed a German-made Spancrete machine for manufacturing prestressed concrete slabs at the Waukesha plant; the new plant is operated as the Spancrete Division of the West Allis firm. The machine, claimed to be the only one of its kind in the U. S., consists of a concrete casting unit mounted on a gantry crane, capable of pouring more than 100 cu. yd. of concrete slabbing in one continuous operation. Slabs are made in widths of 20 and 40 in. and in depths of 4, 6, or 8 in. The unit can produce about 4 ft. per min., and six men can turn out four 330-ft. planks a day.

This installation includes six 330-ft. long plank beds, each with a capacity of 10 planks, one on top of each other. A mobile power saw is used to cut the units into desired lengths. Prestressing is accomplished through use of up to 24 pairs or reinforcing strand wires extending the length of the bed; these are normally stressed to 2250 lb. To reduce weight, the slabs can be made with a series of hollow cores extending their entire length.

Henry Nagy and Arthur Hinz, owners of the West Allis firm, have exclusive franchise and patent rights from the German Spancrete manufacturer for the sale of Spancrete machines in the western hemisphere. They also have their own patents pending on modifications of the device.

Texas Association Elections

THE TEXAS CONCRETE ASSOCIATION held its annual meeting at Austin, Texas, on April 24 through 26. J. C. Fountain, Dods and Fountain Co., Greggton, Texas, was elected president, and Ervin Hahn, Atlas Building Products, El Paso, Texas, was elected secretary-treasurer. Directors elected were Nolan Browne, Nolan Browne

NOTED OPERATORS IN READY MIXED CONCRETE TURN TO . . .

The new ROCKET

Many well-known producers of ready mixed concrete have tried the new Rocket, and have voiced their approval with re-orders. Their reasons are plain enough. First, they like Concrete Transport Mixer Company's policy of dealing direct with the customer, enabling him to buy a high-quality, light-weight mixer for considerably *less* than other makes. Then too, they like the simplified design—no complicated mechanisms to add weight and increase cost. These are the men who attribute much of their success to rugged, dependable equipment—obtainable at exceptionally reasonable prices. Their endorsement is staunch testimonial to the high quality of products manufactured and guaranteed by Concrete Transport Mixer Company.

LOOK AT THESE FEATURES!

Hydraulic Chute Control eliminates manhandling. Controls grouped for easy access.

Aluminum Extension Chute attaches to 36" fold-over addition to main chute. Total length: 12' 6".

Electric Revolution Counter kit included; you can handle any specifications with the Rocket!

Special Alloy, abrasion resisting steel used at all wear points.

Unobstructed Hopper, for rapid charging, no spilling or waste.

Positive Chain Drive, flexible power, not affected by truck twist, road shock.

Standard Industrial Engine, truck-type transmission. Repair parts readily available.

Three-Point Suspension, one-piece cast steel precision machined ring.

Available in 3, 3½, 4½, 5½, 6½ yd. models.

DEMAND THE BADGE OF DEPENDABILITY

CONCRETE TRANSPORT MIXER CO.

MAIL THIS COUPON TODAY!

Gentlemen: Please rush me complete prices, literature, and terms on the following:

☐ New Rocket Revolving Drum Truck Mixer
☐ Hi-Lo Stationary Drum Truck Mixer
☐ Batching Equipment
☐ Plant Mixers ☐ Water Meters CP

Name_____
Firm_____
Address_____
City_____ State_____

4987 FYLER AVE., ST. LOUIS 9, MO. FLanders 2-7800

Unit Masonry Association meeting, 1st row, left to right: Frank T. Smith, president; Jos. W. Radotinsky, architect, guest speaker; Harold W. Bird, trustee and chairman, Nominating Committee. Second row: Robin E. Walker, trustee and treasurer; J. E. Miller, trustee and chairman, Apprentice Committee; and Tip Brown, secretary-manager

Co., Dallas, and Ed Jancik, TexCrete of Houston, Houston. Remaining on the board of directors were: Tom Jewell, Jewell Concrete Products Co., Waco; John Barton, Texas Concrete Block Co., Lubbock; and Everett Knott, retiring president, TexCrete Co. of Dallas.

•

WILLIAM J. MURPHY has started operations at a recently built concrete block plant at Salem, Ore.

Unit Masonry Meeting

UNIT MASONRY ASSOCIATION, Kansas City, Mo., held its first annual meeting, June 15, at the Advertising and Sales Executive Club with 120 persons attending. Guests included Harvey A. Lee, vice-president, Anchor Concrete Products Co., Buffalo, N. Y., and Ted Leba, manager Washington office, National Concrete Masonry Association. The association officers were unanimously re-elected; they are as follows: Frank T. Smith, president, Bricklayer's Union No. 18, Kansas A.F. of L.; Weldon B. Royse, vice-president, W. B. Royse Masonry and Waterproofing Co.; Robin E. Walker, treasurer, The Carter-Waters Corp.; and Lester S. Smith, secretary, Bricklayer's Union No. 4, Missouri A.F. of L. Tip Brown is secretary-manager.

Some minor changes were adopted in the By-Laws and a budget of $1290 was approved, a slight increase over 1954. Guest speaker, Jos. W. Radotinsky, architect of Kansas City, Kan., gave advice to the masonry industry in profiting from the decline in use of building materials that were in high favor at one time, attributed largely to lack of good sales and merchandising policies. He emphasized the need for utilizing opportunities to lower building costs through better designing, improved handling from origin to job, and integrity of workmanship. Mr. Radotinsky concluded his remarks with the recommendation that the public be given the facts about masonry through Unit Masonry promotion channels as a safeguard to the future.

•

MT. PLEASANT READY-MIX CO., owned by Harry Coder and Carl Burky, is opening a new ready-mixed concrete plant at Crawfordsville, Iowa.

PENN-DIXIE
CONCRETE adds new dimensions to playgrounds
PENN-DIXIE CEMENT
Corporation
OFFICES: New York • Boston • Atlanta • Des Moines
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UNLOADS ON BOTH SIDES and REAR

Introduced at Cleveland Convention—already sold in eight states. Mr. Emil F. Zuber of The Michigan Silo Company, Peoria, Illinois, whose unit is shown above, writes us as follows:—". . . I know you will be glad to hear that our customers as well as ourselves are very much pleased with this Unloader. If we were in the market for more equipment of this type it would be another Side-O-Matic."

FOR FULL DETAILS AND PRICES, WRITE OR PHONE

SIDE-O-MATIC UNLOADER CORP.

P. O. Box 1561, York, Pa.

Associated with York Stone & Supply Co., York, Pa. • Phone 7357

PATENTS APPLIED FOR

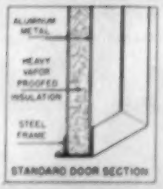
SAVE FUEL • REDUCE CURING TIME
CUT COSTS • UP PROFITS
with *Standard* KILN DOORS!

WHERE AISLE SPACE IS LIMITED STANDARD sliding doors need no aisle space. The carrier-type door (shown) requires 15" minimum clearance above top of door opening. A vertical sliding door, counterweighted for easy opening, is also available.

WHERE HINGE-TYPE DOORS ARE PREFERRED Choose from two STANDARD hinge-type doors. The top-hinging door (shown) can be used when there's insufficient room at sides of door. The conventional side-hinging door has rugged hinges and positive-seal lock.

CHECK THESE FEATURES

- ✓ **Heavy Aluminum Sheets on Both Sides of Thick Vapor Proofed Insulation.**
- ✓ **Rugged Steel Frame.**



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Get the Best — Send for Details Now

STANDARD DRY KILN COMPANY

798 S. HARDING ST. . . . . INDIANAPOLIS 21, IND.

$ Add to Block Plant Profits $
by Promoting SOFFIT Floor Filler Block

Provides a Natural Base for RADIANT HEAT Jobs!

Now — You can add to your profits by supplying customers with Soffit Block for floors and roofs, in addition to Vibrapac Block for walls. Soffit Block floors are permanent and fireproof. They form an ideal base for installing heating coils for radiant heat jobs. The textured and patterned ceiling has maximum acoustical and insulation values . . . can be plastered, if desired.

Produce SOFFIT Block on Your Besser Vibrapac

The same machine that makes high quality wall block, also produces Soffit Block, using the same set of Plain Pallets.

Write for Bulletin No. 77

BESSER COMPANY

ALPENA, MICHIGAN, U. S. A.

Complete Equipment for Concrete Block Plants

—Sh-s-s-h!—

Are you open to deal in lucrative

Underground Activities?

BIG PROFIT MANUFACTURING
Cement Drain Tile

Farm drainage—home building—reclamation projects—highway construction. From these and other sources comes an ever-growing demand for drain tile. More local plants are urgently needed.

It's a wide-open opportunity. Either as an independent, full-time business or as a profitable addition to other concrete products.

CHAMPION Drain Tile Machine

Champion-made tile are dense, strong and truly round. Far superior to clay tile—worth more but can be sold for less without sacrifice of profit.

Champion machine makes manufacturing easy. With automatic feeder it becomes 1-man operation. Makes all sizes up to 12", yet requires only a modest investment.

W. E. DUNN MFG. CO.
528 W. 24th Street, Holland, Mich.
CANADA: Dunn Masonry Machinery, Ltd.
978 Dundas H'way, Cooksville, Ont.

Get
STEAM QUICK with **"Kwik-Steam"**
(IN 2 MINUTES)
for curing Blocks and Pipe
with the Littleford
"KWIK-STEAM" Vapor-Clarkson Generator

Modulating controls
fully automatic
steam where you want it
operates at full or half capacity
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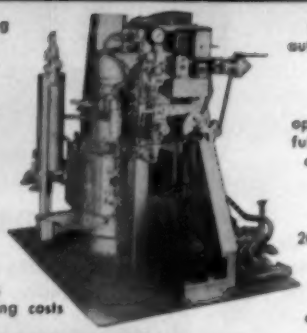
sizes from 20 to 165 BHP
cuts manufacturing costs
speeds up curing cycle



You get steam in 2 minutes flat from a cold start with the Littleford "Kwik Steam" Generators. And you save real money on concrete manufacturing costs, because the "Kwik-Steam" reduces labor costs 50% (no skilled labor required) and speeds up the curing cycle. There's a size for your plant. Send for descriptive bulletin.

Send for Bulletin EE-22

LB LITTLEFORD
LITTLEFORD BROS., INC.
400 E. Pearl St., Cincinnati 2, Ohio

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Patented
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Concrete **STEPS**

A Small Investment That Pays Big Dividends

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AMERICA'S FINEST MOLDS AND LOWERING DEVICES

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OSWALT BLOCK MACHINE Sets New Standards in Construction, Operation, Production

- Great Strength and Rigidity
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- Sturdy, Massive Construction
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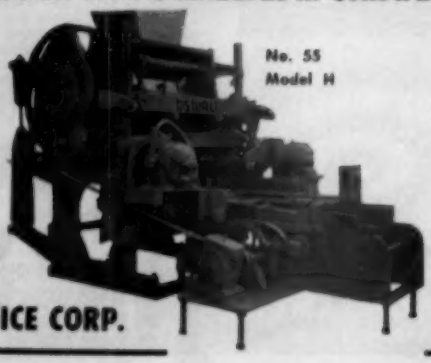
Write for details or visit our plant and see the OSWALT Block Machine demonstrated.



No. 55
Model H

- Smooth, Relaxed Operation
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- Visual Panel Control System

Ask for name of Oswalt-Serviced plant nearest you.

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The Backbone of STEEL
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modern Dur-O-waL reinforcing wins the praise of the man with the trowel. Dur-O-waL lays flat . . . works fast . . . handles easily.

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ANY SHAPE OR SIZE CUT IN SECONDS!

Clipper MASONRY SAW

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Clipper made the world's first Masonry Saw nearly 20 years ago — Clipper makes the World's finest Masonry Saw today! Let Clipper's famous 5-Day FREE TRIAL prove it to you.

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For lowest possible cutting cost, look for the bright orange centers which identify genuine Clipper Superior Blades. All Clipper Blades — Diamond, Abrasive and Reinforced — are manufactured under the most advanced Quality Controls known to the industry, your assurance of consistent quality and peak performance — rim to stub, blade to blade!

206X

Clipper® MANUFACTURING COMPANY
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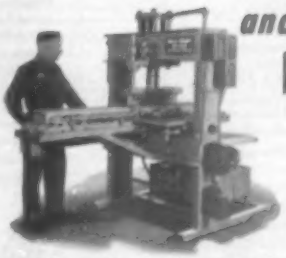
Factory Branches in Principle Cities, Coast to Coast.

Give Customers Beautiful Split Block Like This—

made from Block produced on a Besser VIBRAPAC

and Split on a BES-STONE Block Splitter



Yes—split block *is* beautiful if it's made *right*, using a Besser Vibrapac and Bes-Stone Splitter—the combination that gives you NEW PROFIT OPPORTUNITIES plus SATISFIED CUSTOMERS. Get all the facts from your nearby Besser Representative, or write for literature to:

BESSER COMPANY
Complete Equipment for Concrete Block Plants
ALPENA, MICHIGAN, U.S.A.

WHERE TO BUY

SILENT VIBRATING TABLES FOR CONCRETE PRODUCTS

ALSO, METAL MOLDS FOR SPLASH BLOCKS, STEPPING STONES, CHIMNEY CAPS, and "IDEAL" Combination Step Molds

For Details Write to: R. L. SPILLMAN CO. 18 W. Morrill, Columbus, Ohio

PRESTRESSED CONCRETE FRANCHISE

Lakeland Engineering Associates' proven designs for floor slabs, roof deck, joists beams, bleachers, and bridge decks, available for manufacturing under L E A P exclusive franchise. Write for details.

LAKELAND ENGINEERING ASSOCIATES, INC.
Lakeland, Florida

CONCRETE BRICK COLORS
CEMENT COLORS
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made by
BLUE RIDGE TALC CO., INC.
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COLORS *For Cement and Concrete*

COLOR YOUR CONCRETE WITH LANSCO CEMENT COLORS, available in 40 ATTRACTIVE shades. Suitable for all types of concrete products. Write for our new color card, copy of "Suggestions For Using Cement Colors", and for free samples and price list.

Manufactured by:

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73 Delavan St. • Brooklyn 31, N. Y.

MANY YEARS of PROVEN PERFORMANCE!
NOW—Anyone can repair Concrete easily!
PACKAGING AND DISTRIBUTING FRANCHISES
Welds CRACKS
Bonds NEW CONCRETE to OLD
Stops WATER
Saves TIME - Saves LABOR Saves CEMENT
A SMALL INVESTMENT brings BIG RETURNS
WRITE TO CONCRETE WELD CO. FLINT, MICHIGAN

1—Besser concrete mixer, capacity 27 cubic feet, driven by 440 volts, 20 horsepower electric motor. Used only one and one-half years.

Fred Malotte Machinery Co., Inc.
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GOOD WILL BUILDERS

Your contractor and bricklayer customers will be able to do quicker, easier, straighter work with UB Tools . . . tools that carry YOUR OWN COMPANY ADVERTISING. Linestretchers, Corner Ties, Line Pins, Twigs, Concrete Calculators. We also wholesale a complete line of Blocklayers' Tools. Write for literature and prices.

UNITED BUILDERS
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FOR SALE

Serial # C 207 — Stearns Clipper-Stripper Block Machine complete with 2—8" mold boxes, 1—4" mold box. Numerous other parts, pulley belts, etc.

Approximately 1100 8" cast iron pallets.

2000—4" cast iron pallets.

All in fair condition.

$1200.00 for all
Priced for quick sale.

Can be seen in operation—call or write

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BLOCK & SUPPLY CO.
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Try A Small Ad

For Quick Results

FREE SERVICE for Buyers

Get information and prices quickly on machinery, equipment. Check item (or items) about which you desire information. Send to us.

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Send to: Research Service Department

ROCK PRODUCTS

309 W. Jackson Blvd. Chicago 6, Ill.

- ___Admixtures, Aggregate
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- ___Agitators*
- ___Aggregates (special)*
- ___Air Compressors
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- ___Asphalt Mixing Plants
- ___Bagging Machines
- ___Bags*
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- ___Belting, Conveyor, Elevator, Power Transmission*
- ___Belt Repair Equipment
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- ___Bins and Batching Equipment
- ___Bits*
- ___Blasting Supplies
- ___Block Machines, Concrete Building*
- ___Bodies, Trailer*
- ___Brick Machines and Molds
- ___Buckets*
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- ___Winches
- ___Wire Rope

If equipment you are in market for is not listed above, write it in the space below.

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Your Name _____ Title _____

Firm Name _____

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CP 9-55

USED EQUIPMENT FOR SALE

(Located at Vineland, New Jersey)

1—Stearns #9 Jolticrete complete with all necessary motors & controls & complete attachments for making 4", 6", 8" & 12" block.
30—Steel Racks
6000—4" Pressed Steel Pallets
4500—4" Solid Pressed Steel Pallets
5500—6" Pressed Steel Pallets
5000—8" Pressed Steel Pallets
1—18 Cu. Ft. Stearns Skip Hoist (new bucket)
1—28 Cu. Ft. Stearns Skip Hoist (inclined)

(Located at Frackville, Pa.)

1—Stearns #9 Jolticrete complete with all necessary motors & controls. Complete attachments for making 4", 8" & 12" block.
80—72-Block Capacity Steel Racks
4896—7¾x15¾", 45% A.S., Pressed Steel Pallets (BABA)
1056—7¾x15¾", 45% A.S., Corner & Sash Pallets (BATON)
7200—3¾x15¾", 45% A.S., Pressed Steel Pallets (ZONAL)
2300—11¾x15¾", 45% A.S., Pressed Steel Pallets (PADDLE)

(Will sell all or part of above equipment)

MAKE US AN OFFER

Over 20,000 Pressed Steel Pallets in Stock—(Mail us list of your requirements with drawing)

Metropolitan Equipment Co.
P.O. Box 4465 Washington, D.C.
Phone Lawrence 6-1535

TO THE HIGHEST BIDDER

We are offering the following items of equipment, recently obtained from Pacific Brick & Block Co. Pacific, Mo. to the highest bidder. F.O.B. Holland, Mich. All bids must be in our possession on or before October 1st, 1955. All items listed except pallets, may be seen at our plant in Holland, Mich:

1—L-5 Lith-I-Block Machine Set-Up for 8x8x16 Modular Stringer Block (Ser. #12022 purchased March 25, 1953)
1—Air Motor Off-bearing device.
1—Model D Truckman W/Std. 57" x 54" Platform Ser. #2032-W—Motor #1800051—Purchased March 25, 1953.
1—8x8x16 Full Header Attachment (Mold-box type)
1—4x8x16 Attachment (Including mold box)
1—50 Cu. Ft. Gatzke Batch Mixer W/40 H.P. motor (Purchased March 25, 1953)
1201—5/16 x 18½ x 26" Plain Steel Pallets.

LITH-I-BAR CO., Holland, Mich

this sword challenges CANCER

Under the sign of the cancer sword the American Cancer Society seeks to save lives by spreading vital facts to you, your neighbors, and your physicians . . . by supporting research . . . by providing improved services for cancer patients.

Only under the sign of this sword is there a three-fold, national attack on cancer. Cancer Strikes One in Five. Your Dollars Will Strike Back.

Mail Your Gift to "Cancer" Care of Your Local Postoffice

AMERICAN CANCER SOCIETY

ATTENTION!

CONCRETE MANUFACTURERS · READY-MIX PRODUCERS

HAVING A CEMENT STORAGE PROBLEM?

I have cement silos with cap from 300 bbl. to 1000 bbl. all welded seamless construction (divided compartments if desired) legs, hatchway, vent, elevator connection, inside and out ladders, painted, shipped in one piece, no erection problem.

"PRICED TO SELL"

CALL OR WRITE • GRIFFIN • 313 SOUTH MIDLER AVE.
SYRACUSE, N. Y. Phone: 73-1514

1—1950 Rex Adjusto-Heigh 3 yard mixer mounted on 1950 F8 6 wheel Ford with Hendrickson Tandem. Tires 1000.00 x 20. Priced for quick sale $2000.00.

MOLASCHI REDI-MIX
1798 Plainfield Road Joliet, Ill.

FOR IMMEDIATE SALE

Complete Ready Mix Concrete Plant. No competition. $25,000.00 annual net profit. Located in foothills of beautiful Black Hills area. Serving three growing communities plus large oil field operations. $50,000.00 plant, trucks & batchers.

BLACK HILLS READY MIX CO.
Newcastle, Wyoming

FOR SALE

Complete farm drain tile plant and sand-washing plant with 60 acres of gravel deposit in one of the best territories of Southern Minnesota. Priced for quick sale.

BOX N-36, CONCRETE PRODUCTS
309 West Jackson Blvd., Chicago 6, Ill.

1—Multico three block plain pallet block machine with air off bearer and attachments for making 2-3-4-6-8-10-12" blocks with bull nose, corner and half block, brick and chimney. First $7500.00 takes.

Have installed larger machine.

Concrete Products & Supply Co.
Box 389 Fremont, Ohio

PLAIN STEEL PALLETS

Guaranteed Quality

Flat • Square • Accurate

GARY STEEL SUPPLY COMPANY
2300 S. Springfield Avenue, Chicago 23, Ill.
CRawford 7-2525

FOR SALE

5—Challenge Truck Mixers with 165 gallon Water Tanks, mounted on International RF—192 Trucks, 197 inch Wheelbase.

Priced to Sell.

Fehrs Tractor & Equipment Co.
1809-11 Cuming St. Omaha 2, Nebr.

Small Block Plant Owner

I have quite a supply of used machines that are replaced by larger plants who need larger production. Some of these setups are in very good condition. As they are a surplus to me, I will sell on any reasonable terms with payments as low as $50.00 a month.

Mid-Western Concrete Equipment Co.
Box 646 Mukwonago, Wis.

RECONDITIONED

Multico #25 Blockmaster with Dual Vibration makes 4" to 8" high blocks. Equipped with NEW FRONT END Loader. Makes one 12" & one 8" block, two 10" block, three 8" block, five 4" block, 30 brick, two 6" and one 4" block, two 8" header block, chimney and other specialties. With magnetic off-bearer. Production—5 cycles a minute. Must be seen to be appreciated.

MULTIPACK, INC.
7400 Grand Division Ave. Cleveland 25, Ohio

WANTED

Man experienced in precast and ornamental concrete to take charge and build up that portion of business of large southwestern products manufacturer. Must be able to make takeoffs, design forms, layouts, and run production. Civil engineer degree or license desirable but not necessary.

BOX N-62, CONCRETE PRODUCTS
309 W. Jackson Blvd. Chicago, Ill.

BUILD GOOD WILL

Advertising necessities for the block industry. Line Pins, Twigs, Corner Blocks, Calculators. Complete catalog on request.

GERSON CO. 82 Doering Rd.
MATTAPAN 26, MASS.

WANTED PLANT SUPERINTENDENT

Concrete Products Manufacturing, Los Angeles Area. Must be qualified to handle the operation of a large plant producing a new type of concrete product. Must have an overall experience in batching, pouring, forming, steam curing and handling of men. Reply stating experience and salary expected. All replies will be confidential.

BOX N-63, CONCRETE PRODUCTS
309 West Jackson Blvd., Chicago, Ill.

FOR SALE

Fork and platform power lift trucks, used and guaranteed factory rebuilts.

ERICKSON POWER LIFT TRUCKS, INC.
Saint Anthony Blvd. & University Ave. N.E.
MINNEAPOLIS 18, MINNESOTA
Phone—Sterling 1-9508

KEEP ABREAST WITH INDUSTRY TRENDS THROUGH ROCK PRODUCTS

WANTED

Brick racks for use with Dunbrik machine.
Also, Dunbrik pilots.
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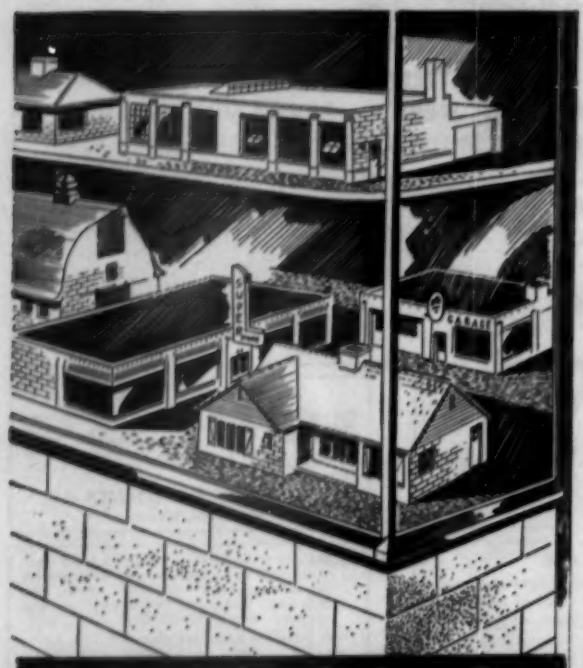

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Most concrete products manufacturers have no windows in which to display the long-lasting and economical buildings made from their products. Yet, each community has many examples of quality concrete masonry structures. These buildings are, in effect, the real window displays of the concrete products manufacturers.

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33 W. Grand Avenue, Chicago, 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete...through scientific research and engineering field work

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WHY Columbia OFFERS WORLDWIDE LEADERSHIP

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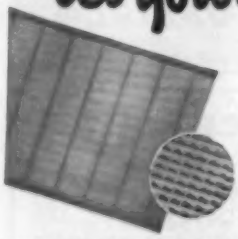

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SIZING
AND SCREENING
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14"	45'	1785	937
14"	60'	2380	1170
14"	85'	3102	1558
18"	25'	1229	654
18"	45'	1859	1005
18"	60'	2384	1254
18"	85'	3209	1665
18"	100'	3764	1912
20"	25'	1266	713
20"	45'	1965	1060
20"	60'	2490	1320
24"	25'	1322	773
24"	45'	2052	1145
24"	60'	2617	1434
24"	100'	4097	2166
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30"	65'	3101	1718
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16"	3.64 foot	2.62 foot
18"	4.03 foot	2.90 foot
20"	4.42 foot	3.35 foot
24"	5.23 foot	3.76 foot
30"	6.39 foot	4.60 foot

Additional widths and plies available at low prices. Write for free sample.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE

3-roll, 5" diameter Troughing Idlers for

14" Belt..	$16.50	24" Belt..	$18.75
16" Belt..	17.25	30" Belt..	19.50
18" Belt..	18.00	36" Belt..	20.25
20" Belt..	18.25	48" Belt..	21.75

1-roll, 5" diameter Return Idlers for

14" Belt..	$ 6.38	24" Belt..	$ 7.50
16" Belt..	6.75	30" Belt..	8.25
18" Belt..	7.13	36" Belt..	8.75
20" Belt..	7.30	48" Belt..	10.25

All steel. Interchangeable with other well-known makes. Replaceable ball bearings. Either sealed type (pre-lubricated) or with alemite fittings. Rust proof ball races. Maintenance is negligible.

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Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders

FOR SALE
Locomotives, 5 to 125 tons, diesel, elec., gas.
Monighan Walking draglines, 9, 7, 5W, 200W.
Shovels, cranes, draglines, ½ to 14 yds.
Jaw crushers, 48"x60", 42"x48", 60"x84".
Locomotive cranes, 4-Orton 25-ton diesel.
Euclid diesel rear & bottom dumps, 15-22 tons.
25-yd. diesel Tournarockers, model E-50 (3).
Rotary dryers, kilns: 8x125, 7x110, 5'x60'.
Colby elec. traveling hammerhead crane, 14-ton.
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Lancaster 6' dia. Vert. Mixer 25 HP.
Kent Model #3 Continuous Mixer.
Abbe 27" x 20' Ball Mill Chrome-Mang. lined.
Raymond #00 and #1 Pulverizers.
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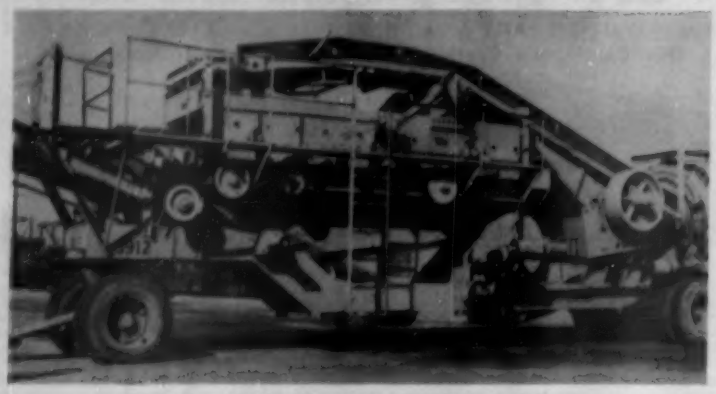
PORTABLE CRUSHING PLANT FOR SALE



CEDAR RAPIDS "SUPER JUNIOR TANDEM"
serial number 13126, consisting of:

1 — 4' x 14' triple deck screen
1 — 24" x 16" roll crusher
1 — 10" x 36" roll jaw crusher
1 — 18" x 21' - 6" sand attachment

Regular conveyors, plus 30" x 58' lattice frame delivery conveyor extension and 30" x 40' channel frame feed conveyor extension, feeder and grizzly. Powered by Caterpillar Model D13000 diesel engine. All mounted on Trailer Equipped with 12 - 900 x 20 tires.

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BUCYRUS ERIE 42T Blast Hole Drill, diesel power & 7/8 Bit Dresser, tools, bits, drills, etc. Used two seasons. Excellent. Less ½ new price. $16,000 Yard.

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UNIVERSAL 3240 IMPACT MASTER w/3x12 apron feeder, under conveyor, mounted portable tandem rubber. Al. A buy at $15,500 Rental Purchase.

CEDAR RAPIDS SUPER TANDEM Portable Gravel Plant w/10x36 rb. Jaw, 24x16 rolls, 4x14 2½-deck horz. vibr. Screen, 30" conveyors, GMC diesel power, mounted portable tandem rubber, New 1951. Excellent. $30,000 Texas. Rental Purchase.

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TELSMITH 10x36 rb. Jaw Crusher, good. $1850 Yd.

PIONEER 10x30 rb. Jaw Crusher, V-groove flywheel. $1350 Yard.

ROGERS 10x18 pb. Jaw Crusher, like new. $400 Yard.

PORTABLE CONVEYOR 24"x50', excellent. $1750.

CEDAR RAPIDS 4x13 2-deck horizontal Screen $1750.

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MODEL 56
NOW OPERATING
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Available throughout the U.S. — Items you need may be available near you. Your inquiries would be appreciated.

Buildings	Derricks	Loaders	Pavers
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Cableways	Engines	Mills	Shacklines
Cars	Excavators	Machine-tools	Shovels
Compressors	Feeders	Pulverizers	Tanks
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Dryers	Hoists		Etc., Etc.
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(I can sell your surplus equipment)

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ELECTRIC SHOVEL

P & H Model No. 1500—Five Yard Shovel—34' Boom—22'6" stick—Westinghouse Motors. Ward Leonard Control—Excellent Condition Weather proof house. Priced at about 40 per cent replacement value—Large stock spare parts available.

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25 ton Ind. Brownhoist Diesel Loco. Crane.
65 ton Porter Diesel-Elec. Locomotive.
25 ton Whitcomb Diesel Loco. 1949.
140 HP Christian 2D Diesel Hoist & Swinger.
25 ton American Steel Guy Derrick
Koehring 1005 Diesel Crane 2½ yd. 1952.
Manitowoc 3000A Diesel Crane 1¾ yd.
2300 CFM C-P OCE Air Compr. 350 HP.
160 HP Caterpillar D-17000 Diesel Unit.

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3043 Buchanan Jaw, never assembled, approx. $4,000.00 parts missing $5,700—8466 Allis-Chalmers jaw with motor—3' Symons std. and shorthead—A-C Sup. McCully 30"—12K Gates—5424 Pioneer triple roll new cost $27,000 used two seasons $9,750—5 x 14 Marcy rod mill $5,750—Three 25 ton trolley locomotives lot $23,000—Five NEW battery locomotives & 3 sets batteries, 36.4" ga., 10 tons all for $37,000—About 40 Koppel tow-way side dump cars & 3 Plymouth gasoline locomotives all 24" ga. all for $3,500. Differential Electric Co. haulage equipment including 4 locomotives with built-in side dump car and 17—130 cu. ft. air dump cars, std. ga.—Manitowoc 4500 dragline $84,000 Joy 56 blast hole drill—78" & 48" spiral classifiers—Cedar Rapids AA 2325 primary plant, 1953, complete $28,500.

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List Your Surplus Equipment With Us.

DEPENDABLE USED MACHINES

Special:—Pioneer port. gravel plant with 10x36 jaw crusher, pn. tires, Int. Diesel motor

American 1¼ yd. shovel	Universal 880 Diesel gravel plant	Eagle cinder crusher
Byers ½ yd. shovel	Cedar Rapids 30x18 roll crusher	16x16 roll crusher
Link Belt ⅝ yd. dragline	Pioneer-Mesabi 4x16 d.d. screen	Jeep trencher
N.W. ⅝ yd. truck crane	40' bucket elevator; 12" buckets	5x12 screen
Lesoman loader	45 ton, 3-comp. portable steel bin	2000# breaker ball

These machines reconditioned in our newly-built daylight plant. Come see them.

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FOR SALE

2036 Universal Crusher Complete with 36"x8' Pan Feeder Serial #115X4 .....$10,000.00
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3" Sullivan Wagon Drill Serial #8832 .....$800.00
Screens & Drivers $500.00
210 Yeager Air Compressor $3,500.00
918 Universal Crusher Serial #318 .....$500.00

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ALSO SEE READY-MIXED CONCRETE AND CONCRETE PRODUCTS EQUIPMENT WHERE TO BUY ADVERTISING IN CONCRETE PRODUCTS SECTION

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Lima 2400 6 yd. diesel shovel
Lima 1201 3½ yd. diesel shovel
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625 Page diesel walker 9 yd. 150' boom
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4500 Manitowoc 5 yd. 120' drag
618 Page diesel walker 5 yd. 125' boom
1201 Lima 85' boom 3 yd. drag-crane
3500 Manitowoc 2½ yd. 85' drag
95 Northwest 2½ yd. 70' diesel dragline
955 P&H 85' boom 2½ yd. diesel dragline
2000 Manitowoc 1½ yd. diesel shovel
K-480 Link Belt 80' 2 yd. diesel crane-drag, independent boom hoist
604 Lima 65' boom 1½ yd. diesel dragline
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255 PC P&H 20-ton truck crane 80' folding boom 30' jib
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58-BH Joy Champion Rotary Air Drill
2—DW-10 Tractors and 12 yd. Athey side dump wagons
2—520 GarWood 18 yd. scrapers

Many Good Used Trucks

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20" & 30" Superior McCully Gyratory.
24" x 36" & 48" x 60" Traylor Bulldog Jaw.
1—54" x 24" Pioneer Crushing Rolls.
222R Allis Chalmers Hydro Cone.
42 x 16, 36 x 16 & 30 x 16 Crushing Rolls.
36 x 24 Jeffrey B 75 hp, 440 V. Hammermill.

LOCOMOTIVES & CRANES

15 Ton Diesel 60' Boom Whirley Crane.
3—65 & 44 Ton G.E. Diesel Elec. Locomotives.
10 Ton Plymouth Diesel Locomotive.
35 & 25 Ton G.E. Diesel Elec. Locomotive.
25 Ton Amer. Diesel Loco. Crane.

42 IN. BELT CONVEYORS

42 In. x 58' STACKING CONVEYOR.
42 In. Telescope Conveyor 536' Long.
7—42 In. Conveyors 512' to 900'.
2000—New Trough & Return Idlers.
4000 Ft. New 6 Ply 42 In. Belt.

REDUCTION MILLS

1 Williams 4 Roll High Side Pulverizer.
12 Rod Mills 30" x 54", 4' x 14', 5' x 10', & 6' x 12' Denver, Marcy & A.C.
45 Ball Mills: 3'x4', 3'x7', 4'x5', 5'x8', 5'x10', 5'x18', 6'x5', 6'x8', 6'x10', 6'x9', 7'x5', 7'x6', 7'x7', & 3 Marcy 86.
29—Hardinge Mills: 10'x48", 8'x18", 8'x36", 8'x22", 7'x36", 6'x36", 6'x22", 6x14", 5'x36", 5'x24".

20E CLYDE WHIRLEY CRANE

1—45 Ton 100' Boom Electric.

ROTARY KILNS

19—4'x42', 4'x28', 6'x28', 7'x110', 7½x7x125, 8'x125' & 9'x125'.

ROTARY DRYERS

3'x26', 4'x20', 5'x35', Single Shell.

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60 E. 42nd Street, New York 17, N. Y.

Quarry Equipment

Cedarapids 3240 5A primary unit. New condition.
Cedarapids 4A 2540 Primary unit with feeder, etc.
Telsmith 13B gyratory 13" primary or secondary.
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Telsmith 9x36 jaw crusher.
Cedarapids 2020 double impeller breaker.
Universal 3' x 12' feeder.
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Cedarapids 4' x 14' double deck screen.
Tyler Niagara 3' x 12" triple deck screen.
15 cu. yd. Cedarapids sand drag. New.
60-ton, 2-comp., 8' x 18' storage bin w/clam gates.
Special bins to your specifications.
Conveyors—18"-24"-30"-36". Also belting.
18" dia. x 30" face magnetic pulley.

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Lorain 77, 1½-yd. diesel shovel. Good condition.
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TRACTORS, TRUCKS, SCRAPERS, ETC.

3—Euclid rear dumps, 22 ton. Good condition.
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Woolridge 15-18 yd. Model TCR scraper.

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Caterpillar D7700, 63 H.P. @ 1600 RPM. Rebuilt.
Caterpillar D13000 6-cyl. diesel engine, Twin Disc clutch, extended shaft, outboard bearing, 145 H.P. @ 1000 RPM. Rebuilt.
Caterpillar D17000 8-cyl. diesel engine with Twin Disc clutch, 190 H.P. @ 1000 RPM.
GMC 6-71 diesel engine radiator to and including clutch, 180 H.P. @ 1600 RPM constant duty, electric starting equipment. New condition.
GMC 12-cyl. twin diesel engine complete from radiator to and including automotive type clutch with gear reduction unit, fabricated base, electric starting system, 360 H.P. @ 1200 RPM. New condition.

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2—40" Memco lifting magnets, used 2 months.

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500 cu. ft. Gardner-Denver diesel, rebuilt.
365 cu. ft. Gardner-Denver diesel, rebuilt.

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422 Ft. 4/0 R.C. Stranded Aluminum Wire.
7—40 H.P. Wound Rotor Motors 900 RPM —220 V, A.C.
1—50 H.P. Wound Rotor Motors 900 RPM —220 V. A.C.
1—40 H.P. Squirrel Cage Motors 1800 RPM —2200 V. A.C.
2—50 H.P. Squirrel Cage Motors 900 RPM —2200 V. A.C.
2—50 H.P. Squirrel Cage Motors 1800 RPM —2200 V. A.C.
5—75 H.P. Squirrel Cage Motors 1800 RPM —2200 V. A.C.
10—Capacitors 7½ KVA—230 V. 3 ph 60 cy.
11—Capacitors 15 KVA 2400 V. 1 ph 60 cy.
29—Oil Circuit Breakers (no trip coils) 2500 V. 50 to 600 amps.
Large stock of Lightning Arrestors, Cut Outs, Glass & Porcelain Insulators, Pole Hardware, 200 & 400 amp. 220 V. Safety Switches 3 pole.
Jacks—5 Ton Track—25 & 50 ton screw jacks, Anchor Pull Jacks—5 ton.
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Several thousand feet of link Belt C 121 chain.
New Carriage Bolts at 2/3 Jobbers prices in B'HAM.
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106 pieces New 4" boiler tubes 18 ft. long.
18 pieces New 4" boiler tubes 21 ft. ½" long.
New 6", 12" Composition Belting.
New Asbestos Brake Lining ½" by 2½", 3-3½ & 5" wide.
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1140 Ft. of 4" Diam. x 12 ft. lead joint cast iron pressure pipe—good condition.
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1—AMSCO Manganese Steel 4-Yard Vanderhoef-Missabe Type Dipper, complete with Vanderhoef teeth and bail, 3 years old and in A-1 condition.
1—Model 543 Barber-Green Bucket Loader in A-1 condition.

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FOR SALE: CRUSHING PLANT EQUIPMENT
In Good Working Condition

A. No. 35½ Kennedy-Van Saun secondary (gyratory) crusher with 25 H.P. synchronous motor built into crusher shaft.
B. 36 x 36 Cedar Rapids ball bearing jaw crusher.
C. 36" x 6'6" Cedar Rapids heavy duty crusher feeder.
D. 30 x 18 Cedar Rapids two-roll crusher, with grooved flywheel.
E. No. 6-D Gates type Allis-Chalmers gyratory crusher.
F. 9 x 36 Cedar Rapids plain bearing jaw crusher.
G. 3' x 8' 3-deck Tyler vibrating screen with 7½ H.P. motor.
H. 3 x 6 3-deck Deister vibr. screen with 3 H.P. motor.
I. 3 x 6 2-deck Deister vibr. screen with 3 H.P. motor.

ELECTRIC MOTORS, all 3 phase 60 cycle

	Make	H.P.	Volts	R.P.M.	Type, Ser. No., Etc.
J	G.E.	75	2300	900	L. 1185974 Ball bearing
K	G.E.	75	2300	900	SC Total encl. Ball bearing
L	G.E.	75	2300	900	KT 3064 plain bearing
M	G.E.	40	220	1200	I magnetic starter, pl. brg.
N	West.	20	220	1160	Oil auto starter, pl. bearing
O	West.	15	220	1160	Magnetic starter, pl. bearing
P	Century	7½	220	1740	Magnetic starter, pl. bearing
Q	Century	7½	220	1740	Magnetic starter, pl. bearing
R	Century	5	220	1740	Magnetic starter Type 3C 254 SC3
S	Louis-Allis	5	220	1160	Magnetic starter Type 06X
T	Westing.	5	220	1160	Magnetic starter Type O3
U	Howell	5	220	1740	Magnetic starter Type K
V	Howell	5	220	1740	Magnetic starter Type K
W	U.S.	40	220	1740	Tot. encl. ball brg. Oil auto. starter

Also: 3—25 KVA 2400 volt Transformers
2—15 KVA 2400 volt Transformers
1— 5 KVA 2400 volt Transformers
1—300 amp. 4800 volt Oil Switch

Will sell individual items or entire list, as is and where is, as one sale, at ridiculously low price. Must move plant to make way for new super-highway. Plant is at present in actual operation.

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Plato 4x6 Vibr. Screen 2 Deck
Universal 42x96 Double Deck
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Hummer Type 31 Screen 6'x5'
Link Belt P148 Screen
Hummer motor-generator sets
Enclosed Cont. Elevator 20"x75'
New & Used Elev. Buckets, all sizes
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628' 42" Conv. Belt (New)
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75—18" Ball Bearing Idlers
1500' 126C Mail. Roller Chain
Jeffrey 24x30 Flextooth Crusher with 40 HP motor, ring hammers
Allis-Chalmers R322 gyratory
Pioneer 54x24 roll crusher
Bonded Scale 12x16 Cinder Rolls
Raymond #00 Imp Mills, Collectors
Acme Jawcrusher 10x18
Climax Jawcrusher 9x16
Climax Jawcrusher 10x20
Champion 9x16, lever type jaw
Traylor 10x16 H Blake type crusher
American Clay Disintegrator 24" w.
Wilfley 4" sand pump
American 4" pump 140' H. 600 gpm
75 Assorted gearmotors to 20 HP
18 Link Belt Reducers 3 to 25 HP
110 Reducers ½ to 30 HP
Jeffrey #224 tripper, automatic
Whitcomb 10 ton loco. 36" ga.

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136 Coit St. Irvington 11, N. J.

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10' x 200' x ⅝" comb. chamber,
8' x 125' x ¾" firing hood.
8' x 72' x ⅝".
7' x 110' x 9/16" brick lined.
6' x 74' x ½" with lifters.
5' x 67' x 5/16" with lifters.
5' x 40' x ⅝" with lifters.
4' x 42' x 9/16" brick lined, oil fired.
3' x 16' x ½" brick lined, oil fired.

Link-Belt Roto Louvres

310-12 with heating coils, cyclone.
502-20 with furnace, collector and fans.
604-24 with furnace or heating coils.
706-20 Stainless contact parts, complete.

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Dixie 36" x 50" Hammermill.
Traylor 18" x 36" Bulldog, Jaw.
Hardinge 10' x 48" Ball Mill, 400 HP.
Patterson 6' x 8' Ball Mills (3 avail.)
Kennedy Type M 5' x 6' Ball Mill

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Allis Chalmers—4 x 12, 3 x 12 lowhead.
Tyler 4 x 7 with thermionic unit.
Tyler—5 x 12, 3 x 10 wet type.
Link-Belt 3 x 8 double deck.
Robinson Gyro Sifter 28A

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1800 CFM 100 PSI 300 HP Bury.
827 CFM 100 PSI 60 HP, I.R. Imperial X.
215 CFM 75 PSI 30 HP, I.R.
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Gayco, 8'-4'-5'-18" all with motor drives.

Deep Well Pump

6000 GPM Peerless 80' TDH, 150 HP.

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Machinery and Equipment Merchants

FEEDER: Traylor heavy duty, cast manganese Pan Feeder, 60" x 15', 20 H.P. motor, speed reducer, complete, NEW condition. Weight 70,000 lbs.

DRYER or COOLER: Link Belt Multi-Louvre with all accessory equipment.

PUMPS: 2—1" Deaver sand pumps, vertical type, with 1½ H.P. motors.

BELT CONVEYOR: 60" x 300', complete with supports, motor, etc.

SCREENS: Robins heavy duty scalper screens, 6'x12' and 4'x6' with 6" & 9" square openings. Allis Chalmers 4' x 12' and 3' x 12' single deck. Tyler 5' x 12' Tyrock F-600. Also 3' x 10' Hummer Screen.

MAGNETIC SEPARATOR: Exolon High Intensity, Double 30".

JAW CRUSHERS: Allis Chalmers 18 x 30", sectionalized for underground use, V-belt, 50 H.P., 220/440 volt motor, new condition. Also, 48 x 60, 42 x 40, 36 x 48", with or without motors and drives. Other sizes from 4"x6" to 48"x60".

ROLL CRUSHER: Double roll crusher, 16" dia., 16" face. NEW condition.

OVERHEAD ELECTRIC CRANE: 1—10 ton, 54' span, 4 motor bucket operating, 440 volt, AC, cab control. Other cranes AC and DC 5 ton to 150 ton.

LOCOMOTIVE CRANE: 25 ton capacity, standard gauge, gasoline powered, case steel trucks, air brakes, with or without 1¼ yd. Williams clam shell bucket, thoroughly modern, excellent condition. Located Minnesota. For sale or rent.

LOCOMOTIVES: 2—65 ton diesel electric, standard gauge, thoroughly modern, excellent condition. For sale or rent.

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HOIST MOTORS:
300 H.P., 435 RPM. 600 H.P., 710 RPM.
400 H.P., 588 RPM. 1200 H.P., 444 RPM.
2200 volt, A.C., with controls.

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Screen Top

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Plymouth Meeting, Pa.

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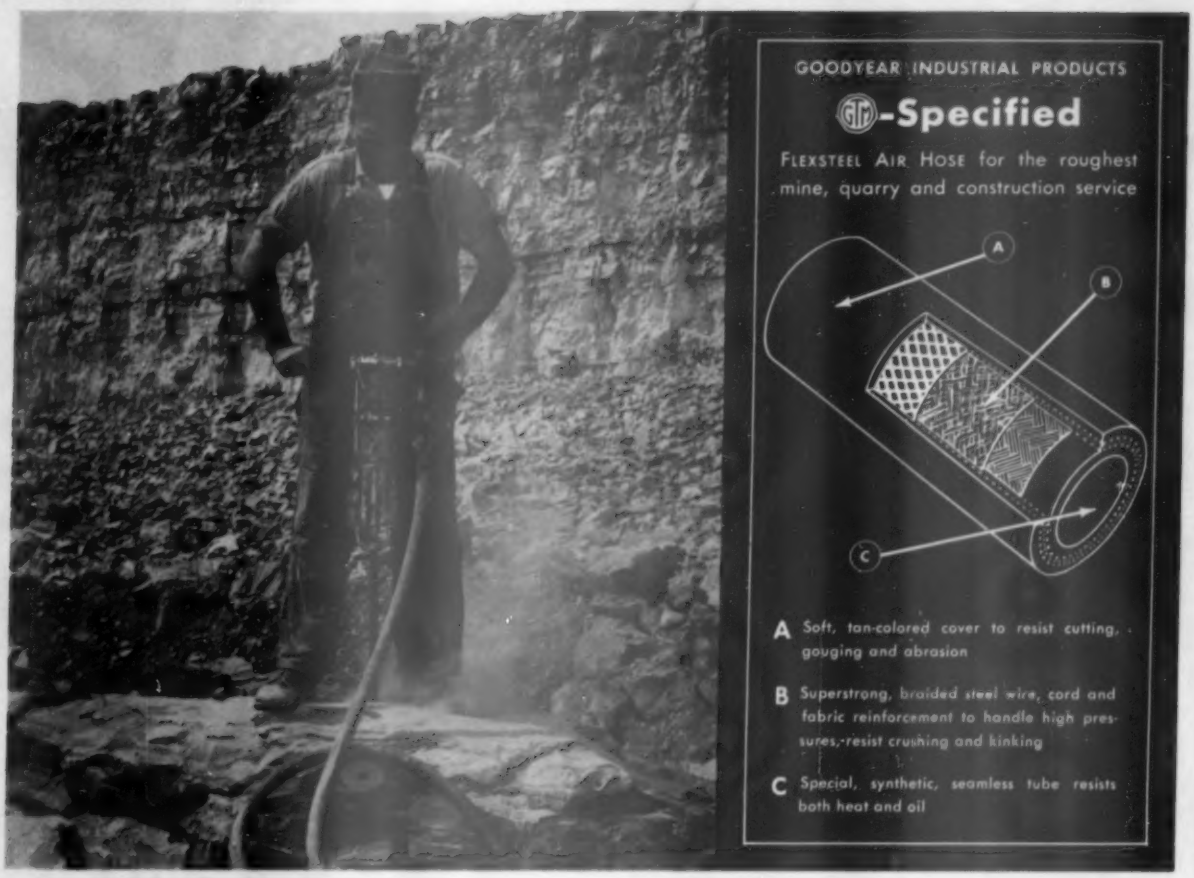
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